OBESITY, PHYSICAL ACTIVITY AND NUTRITION IN KANSAS

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OBESITY, PHYSICAL ACTIVITY AND NUTRITION IN KANSAS

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EXECUTIVE SUMMARY

The 2013 *Obesity, Physical Activity and Nutrition in Kansas* report summarizes the current status of overweight/obesity, physical activity, and nutrition in Kansas, including the prevalence of overweight and obesity among adults and youth; the prevalence of concurrent obesity among adults with chronic health conditions and the prevalence of selected chronic health conditions among obese adults; the prevalence of physical activity and nutrition behaviors among adults and youth; and data on selected policy and environment supports for physical activity and nutrition. The purpose of this report is to help guide public health stakeholders at the state and local levels in their obesity prevention and treatment activities by identifying gaps and establishing baselines for planning objectives. On-going surveillance of statewide data described in this report will continue to support stakeholders' need to monitor their progress and evaluate the impact of their obesity, physical activity and nutrition intervention activities.

Report Highlights

Prevalence of Obesity among Adults

- In 2011, 34.8 percent of Kansas adults 18 years and older were overweight and 29.6 percent were obese. In total, **64.4 percent of Kansas adults were overweight or obese in 2011.**
- The prevalence of obesity among Kansas adults in 2011 was significantly higher among those 25 years and older; non-Hispanic African Americans; persons who attained less than a college education; those whose annual household income was less than $50,000, with the exception of those who annual household income was $25,000 to $34,999; those who resided in frontier or densely-settled rural counties; and those living with a disability.
- **In 2011, the prevalence of extreme, or severe, obesity was 5.0 percent.**
- **The percentage of Kansas adults who are obese has increased significantly over the past decade from 20.8 percent in 2000 to 30.1 percent in 2010.**

Prevalence of Obesity among Youth

- During the 2010/2011 school year, 13.9 percent of Kansas high school students in grades 9-12 were overweight and 10.2 percent were obese. In total, **24.1 percent of Kansas high school students in grades 9-12 were overweight or obese during the 2010/2011 school year.**
- The percentage of Kansans high school students in grades 9-12 who were obese during the 2010/2011 school year was significantly higher among non-Hispanic African Americans compared to non-Hispanic whites.

- During the 2010/2011 school year, two-thirds (66.2%) of overweight or obese Kansas high school students in grades 9-12 described themselves as very or slightly overweight, while one-third (29.5%) described their weight status as about right or very or slightly underweight.
- More than two-thirds (71.1%) of overweight or obese Kansas high school students in grades 9-12 were trying to lose weight during the 2010/2011 school year.
- During the 2011/2012 school year, 17.2 percent of Kansas middle school students in grades 6-8 were overweight and 11.5 percent were obese. In total, **28.7 percent of Kansas middle school students in grades 6-8 were overweight or obese during the 2011/2012 school year.**
- In 2011, 15.6 percent of low-income children ages 2 to less than 5 years who participated in Kansas' Supplemental Nutrition Program for Women, Infants, and Children (WIC) were overweight and 12.8 percent were obese. In total, **28.4 percent of low-income children ages 2 to less than 5 years who participated in Kansas WIC in 2011 were overweight or obese.**

Obesity and Chronic Disease

- In 2011, the prevalence of obesity among Kansans 18 years and older was significantly higher among those with diabetes, kidney disease, depression, arthritis, asthma, coronary heart disease, history of heart attack, high cholesterol and high blood pressure.
- **The prevalence of diabetes, kidney disease, depression, arthritis, asthma, coronary heart disease, history of heart attack, high cholesterol and high blood pressure was significantly higher among those who were obese compared to those who were not obese.**
- An estimated 4,393 cancers diagnosed in Kansas from 2005 to 2009 were caused by obesity.

Behavioral Risk and Protective Factors among Adults

- **In 2011, 83.5 percent of Kansas adults 18 years and older participated in an insufficient amount of physical activity, or did not participate in physical activity at all, and thus did not meet physical activity guidelines.**
- **In 2011, 41.4 percent of Kansas adults 18 years and older consumed fruit less than 1 time per day and 22.3 percent consumed vegetables less than 1 time per day.**

Behavioral Risk and Protective Factors among Youth

- **During the 2010/2011 school year, 11.6 percent of Kansas high school students in grade 9-12 did not participate in physical activity for at least 60 minutes on *any* day in the past week.**
- During the 2011/2012 school year, 9.4 percent of Kansas middle school students in grades 6-8 did not participate in physical activity for at least 60 minutes on *any* day in the past week.
- **During the 2010/2011 school year, 25.1 percent of Kansas high school students in grades 9-12 watched TV for 3 or more hours per day and 24.6 percent played video or computer games or used a computer for something other than school work for 3 or more hours per day.**
- **During the 2010/2011 school year, only 17.0 percent of Kansas high school students in grade 9-12 ate fruits and vegetables 5 or more times per day in the past week.**
- During the 2011/2012 school year, only 26.1 percent of Kansas middle school students in grades 6-8 ate fruits and vegetables 5 or more times per day in the past week.
- **During the 2010/2011 school year, 23.1 percent of high school students in grades 9-12 drank a can, bottle or glass of soda 1 or more times per day in the past week.**
- During the 2011/2012 school year, 23.7 percent of Kansas middle school students in grades 6-8 drank a can, bottle or glass of soda 1 or more times per day in the past week.
- During the 2011/2012 school year, 12.5 percent of Kansas high school students in grades 9-12 and 8.3 percent of Kansas middle school students in grades 6-8 did not drink milk in the past week.
- **During the 2010/2011 school year, 12.8 percent of Kansas high school students in grades 9-12 did not eat breakfast on *any* day in the past week.**
- Among Kansas infants born in 2009, 80.2 percent were ever breastfed, 45.1 percent continued breastfeeding at 6 months and 23.1 percent continued breastfeeding at 12 months. Only 37.8 percent of Kansas infants born in 2009 exclusively breastfed at 3 months and only 17.4 percent exclusively breastfed at 6 months.
- Among low-income infants who participated in Kansas' Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 2011, 69.9 percent of were ever breastfed, 18.9 percent continued breastfeeding at 6 months and 9.5 percent continued breastfeeding at 12 months. Only 15.0 percent of Kansas infants who participated in WIC in 2011 exclusively breastfed at 3 months and only 4.5 percent exclusively breastfed at 6 months.

INTRODUCTION

Since 2000, overweight and obesity have reached epidemic proportions in the United States and in Kansas. Since 1995, the prevalence of obesity among Kansas adults has nearly doubled, and by 2010, approximately two-thirds of the state's adult population was either overweight or obese.[1] Obesity increases the risk for several chronic diseases, including coronary heart disease, type 2 diabetes, certain cancers, stroke and osteoarthritis.[2] Such chronic diseases are increasingly burdensome to the healthcare system due to ongoing medical monitoring, intervention and hospitalization. Researchers have estimated that, in Kansas, $1.327 billion in medical expenditures are attributable to obesity, of which 29 percent is financed by Medicare ($286 million) and Medicaid ($99 million).[3]

This document summarizes the current status of overweight/obesity, physical activity, and nutrition in Kansas. Specifically, Chapters 1 and 2 of this report summarize the most current prevalence of overweight and obesity among Kansas adults and youth. Chapter 3 describes the prevalence of concurrent obesity among adults in Kansas with chronic conditions, as well as the prevalence of selected chronic conditions among adults in Kansas who are obese. Chapters 4 and 5 describe the prevalence of physical activity and nutrition behaviors among Kansas adults and youth. Chapter 6 presents data on selected policy and environmental supports for physical activity and nutrition. Finally, technical notes, which provide more detailed information about primary data sources and statistical methods used for this report, are also included.

This report can be used to help guide stakeholders at the state and local levels in developing obesity prevention and physical activity and nutrition promotion activities. On-going surveillance of statewide data described in this report, including the Kansas Behavioral Risk Factor Surveillance System and the Kansas Youth Risk Behavior Survey, will continue to support stakeholders' need to monitor the burden of obesity and its risk factors and outcomes.

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[1] Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1995-2010.

[2] U.S. Department of Health and Human Services. Public Health Service; National Institutes of Health; National Heart, Lung, and Blood Institute. *Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults.* NIH Publication No. 98-4083; 1998.

[3] Trogdon JG, Finkelstein EA, Feagan CW, Cohen JW. State- and payer-specific estimates of annual medical expenditres attributable to obesity. *Obesity*. 2012;20:214-220.

CHAPTER 1: OVERWEIGHT AND OBESITY AMONG KANSAS ADULTS

Body mass index (BMI) is an inexpensive, convenient and reliable measure used to estimate body fatness and is a useful measure for estimating obesity at the population-level. BMI is calculated as weight in kilograms divided by height in meters-squared. Categories and associated ranges for BMI among adults are shown in Table 1-1.

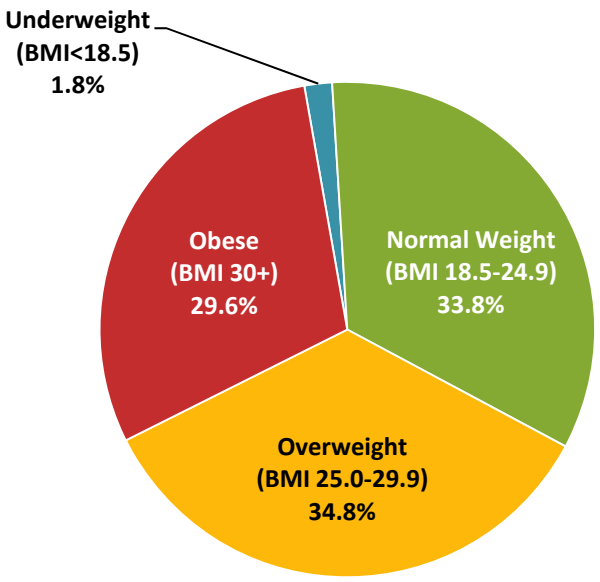
Table 1-1. Body mass index (BMI) category definitions for adults

BMI Category	BMI Range (kg/m^2)
Underweight	Less than 18.5
Healthy Weight	18.5 to 24.9
Overweight	25.0 to 29.9
Obese	30.0 or greater
Class I Obese	30.0 to 34.9
Class II Obese	35.0 to 39.9
Class III Obese	40.0 or greater

Overweight and Obesity among Adults

In 2011, 34.8 percent (95% CI: 34.0% to 35.7%) of Kansas adults 18 years and older were overweight and 29.6 percent (95% CI: 28.7% to 30.4%) were obese (Figure 1-1). In total, 64.4 percent (95% CI: 63.5% to 65.3%) of Kansas adults were overweight or obese in 2011. An additional 33.8 percent (95% CI: 32.9% to 34.7%) adults were normal weight and 1.8 percent (95% CI: 1.5% to 2.1%) were underweight.

Figure 1-1. Prevalence of underweight, normal weight, overweight and obesity among adults 18 years and older, Kansas 2011



Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

In 2011, the percentage of Kansans 18 years and older who were obese in 2011 was significantly ***higher*** among (Table 1-2):

- Persons in age groups 25 years and older compared to Kansans aged 18 to 24 years (16.1%; 95% CI: 13.4% to 18.7%);
- Persons aged 35 to 44 years (33.0%; 95% CI 30.7% to 35.2%) and those aged 45 to 64 years (35.5%; 95% CI: 34.3% to 36.7%) compared to persons aged 65 years and older (26.3%; 95% CI: 25.0% to 27.6%);
- Non-Hispanic African Americans (41.9%; 95% CI: 37.2% to 46.7%) compared to non-Hispanic whites (29.0%; 95% CI: 28.1% to 29.9%) and Hispanics (32.2%; 95% CI: 28.5% to 35.9%)*;
- Persons who attained less than a college education compared to college graduates (24.9%; 95% CI: 23.6% to 26.1%);
- Those whose annual household income was less than $50,000, with the exception of those who annual household income was $25,000 to $34,999 (30.9%; 95% CI: 28.4% to 33.3%), compared to those whose annual household income was $50,000 or higher (27.8%; 95% CI: 26.5% to 29.0%);
- Those who resided in frontier (32.6%; 95% CI: 29.1% to 36.2%) or densely-settled rural counties (32.8%; 95% CI: 30.8% to 34.8%) compared to those who resided in urban counties (27.8%; 95% CI: 26.6% to 28.9%); and
- Those living with a disability (42.2%; 95% CI: 40.5% to 43.9%) compared to those living without a disability (25.6%; 95% CI: 24.7% to 26.6%).

However, the percentage of Kansas adults 18 years and older who were obese did not differ significantly across gender groups.

* Note: Prevalence estimates for race and ethnicity subgroups were age-adjusted to the U.S. 2000 standard population.

Table 1-2. Prevalence of obesity among adults 18 years and older, by selected characteristics, Kansas 2011

Characteristic	Percentage of adults 18 years and older who were obese	95% Confidence Interval
Total	29.6%	28.7% to 30.4%
Gender		
Male	30.0%	28.8% to 31.3%
Female	29.1%	28.0% to 30.1%
Age group		
18-24	16.1%	13.4% % 18.7%
25-34	28.8%	26.5% to 31.2%
35-44	33.0%	30.7% to 35.2%
45-64	35.5%	34.3% to 36.7%
65 and older	26.3%	25.0% to 27.6%
Race and Ethnicity (age-adjusted)		
White, Non-Hispanic	29.0%	28.1% to 29.9%
African American, Non-Hispanic	41.9%	37.2% to 46.7%
Other/Multi-Race, Non-Hispanic	25.4%	21.5% to 29.3%
Hispanic	32.2%	28.5% to 35.9%
Education		
Less than high school	30.6%	27.3% to 33.9%
High school graduate or G.E.D.	31.5%	30.0% to 33.1%
Some college	31.3%	29.8% to 32.8%
College graduate	24.9%	23.6% to 26.1%
Annual Household Income		
Less than $15,000	35.8%	32.5% to 39.2%
$15,000 to $24,999	31.8%	29.5% to 34.0%
$25,000 to $34,999	30.9%	28.4% to 33.3%
$35,000 to $49,999	32.7%	30.5% to 34.8%
$50,000 or higher	27.8%	26.5% to 29.0%
County Population Density		
Frontier	32.6%	29.1% to 36.2%
Rural	31.0%	28.6% to 33.4%
Densely-settled rural	32.8%	30.8% to 34.8%
Semi-urban	30.3%	28.2% to 32.3%
Urban	27.8%	26.6% to 28.9%
Disability Status		
Living with a disability	42.2%	40.5% to 43.9%
Living without a disability	25.6%	24.7% to 26.6%

Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2010 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

In 2011, the percentage of Kansas adults 18 years and older who were overweight or obese was significantly ***higher*** among (Table 1-3):

- Males (70.9%; 95% CI: 69.5% to 72.3%) compared to females (57.6%; 95% CI: 56.4% to 58.8%);
- Kansans aged 25 years and older compared to those aged 18 to 24 years (42.1%; 95% CI: 38.4% to 45.8%);
- Non-Hispanic African Americans (72.8%; 95% CI: 68.7% to 76.9%) and Hispanics (69.2%; 95% CI: 65.8% to 72.7%) compared to non-Hispanic whites (63.6%; 95% CI: 62.6% to 64.6%)*;
- Those whose annual household income was $35,000 to $49,999 (69.2%; 95% CI: 67.0% to 71.4%) compared to those whose annual household income was $15,000 to $24,999 (62.7%; 95% CI: 60.2% to 65.2%) or less than $15,000 (62.1%; 95% CI: 58.6% to 65.7%);
- Those who resided in rural (67.4%; 95% CI: 64.8% to 70.0%) or densely-settled rural counties (69.2%; 95% CI: 67.1% to 71.4%) compared to those in urban counties (62.2%; 95% CI: 60.9% to 63.5%); and
- Those living with a disability (72.5%; 95% CI: 70.9% to 74.0%) compared to those living without a disability (62.1%; 95% CI: 61.0% to 63.2%).

However, the percentage of Kansans 18 years and older who were overweight or obese did not differ significantly across education levels.

* Note: Prevalence estimates for race and ethnicity subgroups were age-adjusted to the U.S. 2000 standard population.

Table 1-3. Prevalence of overweight/obesity among adults 18 years and older, by selected characteristics, Kansas 2011

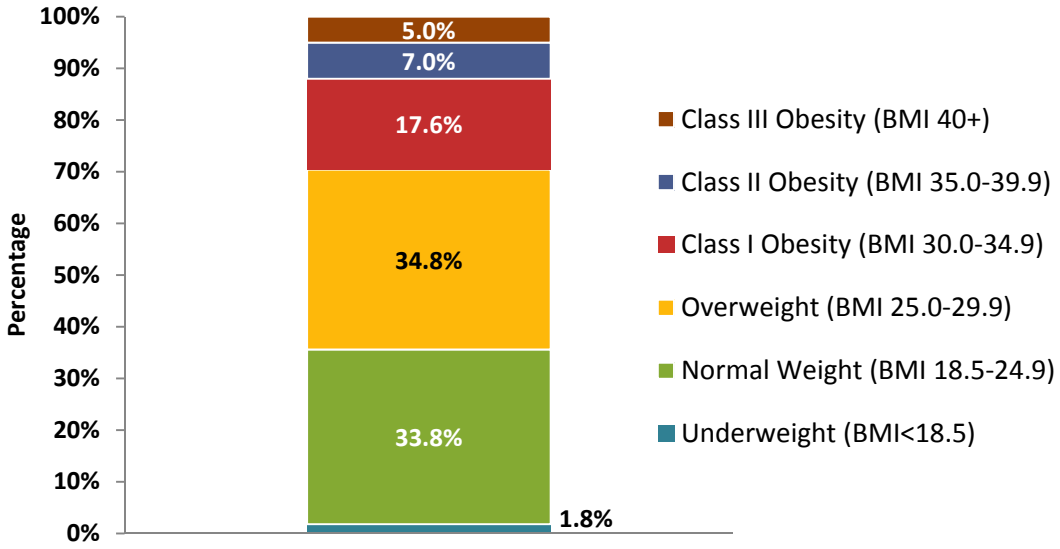
Characteristic	Percentage of adults 18 years and older who were overweight/obese	95% Confidence Interval
Total	64.4%	63.5% to 65.3%
Gender		
Male	70.9%	69.5% to 72.3%
Female	57.6%	56.4% to 58.8%
Age group		
18-24	42.1%	38.4% to 45.8%
25-34	61.8%	59.2% to 64.3%
35-44	68.3%	66.1% to 70.4%
45-64	72.5%	71.4% to 73.6%
65 and older	64.9%	63.6% to 66.3%
Race and Ethnicity (age-adjusted)		
White, Non-Hispanic	63.6%	62.6% to 64.6%
African American, Non-Hispanic	72.8%	68.7% to 76.9%
Other/Multi-Race, Non-Hispanic	60.9%	56.4% to 65.5%
Hispanic	69.2%	65.8% to 72.7%
Education		
Less than high school	63.9%	60.3% to 67.6%
High school graduate or G.E.D.	65.4%	63.7% to 67.2%
Some college	64.8%	63.1% to 66.4%
College graduate	63.0%	61.6% to 64.4%
Annual Household Income		
Less than $15,000	62.1%	58.6% to 65.7%
$15,000 to $24,999	62.7%	60.2% to 65.2%
$25,000 to $34,999	65.9%	63.3% to 68.5%
$35,000 to $49,999	69.2%	67.0% to 71.4%
$50,000 or higher	66.1%	64.8% to 67.5%
County Population Density		
Frontier	66.3%	62.7% to 69.9%
Rural	67.4%	64.8% to 70.0%
Densely-settled rural	69.2%	67.1% to 71.4%
Semi-urban	64.2%	61.9% to 66.5%
Urban	62.2%	60.9% to 63.5%
Disability Status		
Living with a disability	72.5%	70.9% to 74.0%
Living without a disability	62.1%	61.0% to 63.2%

Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2010 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Class I, Class II and Class III Obesity among Adults

The World Health Organization further categorizes obesity into three classes for research and clinical purposes: class I, class II and class III obesity. Class III obesity is also known as extreme, severe or morbid obesity. In 2011, the prevalence of class I obesity among Kansas adults 18 years and older was 17.6 percent (95% CI: 16.9% to 18.3%); class II obesity was 7.0 percent (95% CI: 6.5% to 7.4%); and class III obesity was 5.0 percent (95% CI: 4.6% to 5.4%) (Figure 1-2).

Figure 1-2. Prevalence of class I, class II and class III obesity among adults 18 years and older, Kansas 2011

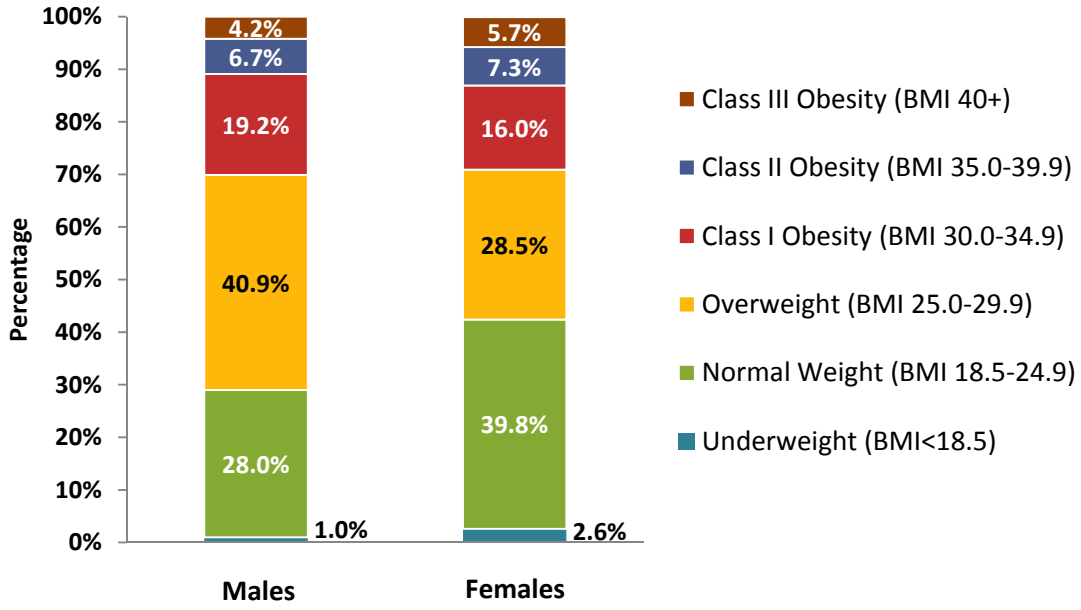


Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Class I, Class II and Class III Obesity among Adults, by Gender

In 2011, the prevalence of class I obesity among Kansas adults 18 years and older was significantly lower among females (16.0%; 95% CI: 15.2% to 16.8%) compared to males (19.2%; 18.1% to 20.2%) (Figure 1-3). However, the prevalence of class III, or extreme, obesity was significantly higher among females (5.7%; 95% CI: 5.2% to 6.3%) compared to males (4.2%; 95% CI: 3.6% to 4.8%).

Figure 1-3. Prevalence of overweight and class I, class II and class III obesity among adults 18 years and older, by gender, Kansas 2011



Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Extreme Obesity among Adults in Kansas

In 2011, the percentage of Kansans 18 years and older who were extremely obese (BMI > 40.0 kg/m^2) was significantly ***higher*** among (Table 1-4):

- Females (5.7%; 95% CI: 5.2% to 6.3%) compared to males (4.2%; 95% CI: 3.6% to 4.8%);
- Adults in age groups 25-64 years old compared to adults aged 18-24 years (2.2%; 95%: 1.3% to 3.2%) and adults aged 65 years and older (2.9%: 95% CI: 2.4% to 3.4%);
- Non-Hispanic African American adults (11.1%; 95% CI: 7.8% to 14.3%) compared to non-Hispanic whites (4.7%; 95% CI: 4.3% to 5.2%) and non-Hispanic persons of other or multiple races (3.6%; 95% CI: 2.0% to 5.1%);
- Those with less than high school education (6.9%; 95% CI: 5.1% to 8.7%) compared to high school graduates (4.4%; 95% CI: 3.7% to 5.0%) and college graduates (3.7%; 95% CI: 3.1% to 4.3%);
- Those whose annual household income was less than $15,000 (10.2%; 95% CI: 8.0% to 12.4%) compared to those whose annual household income was greater than $15,000; and
- Those living with a disability (10.2%; 95% CI: 9.1% to 11.3%) compared to those living without a disability (3.3%; 95% CI: 2.9% to 3.7%).

There were no statistically significant differences in the prevalence of extreme obesity among population density peer subgroups.

Table 1-4. Prevalence of extreme obesity (BMI > 40 kg/m^2) among adults 18 years and older, by selected characteristics, Kansas 2011

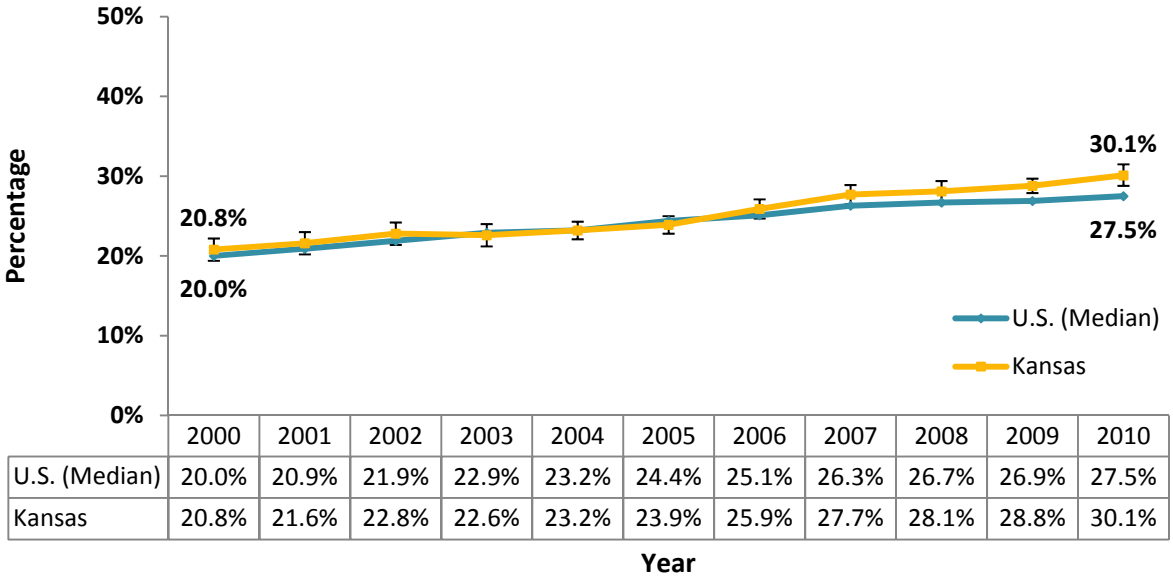
Characteristic	Percentage of adults 18 years and older who were extremely obese	95% Confidence Interval		
Total	5.0%	4.6%	to	5.4%
Gender				
Male	4.2%	3.6%	to	4.8%
Female	5.7%	5.2%	to	6.3%
Age group				
18-24	2.2%	1.3%	to	3.2%
25-34	5.2%	4.0%	to	6.4%
35-44	7.2%	5.9%	to	8.5%
45-64	6.0%	5.4%	to	6.6%
65 and older	2.9%	2.4%	to	3.4%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	4.7%	4.3%	to	5.2%
African American, Non-Hispanic	11.1%	7.8%	to	14.3%
Other/Multi-Race, Non-Hispanic	3.6%	2.0%	to	5.1%
Hispanic	6.0%	4.0%	to	7.9%
Education				
Less than high school	6.9%	5.1%	to	8.7%
High school graduate or G.E.D.	4.4%	3.7%	to	5.0%
Some college	5.9%	5.1%	to	6.6%
College graduate	3.7%	3.1%	to	4.3%
Annual Household Income				
Less than $15,000	10.2%	8.0%	to	12.4%
$15,000 to $24,999	6.1%	5.0%	to	7.2%
$25,000 to $34,999	4.8%	3.6%	to	5.9%
$35,000 to $49,999	4.8%	3.8%	to	5.8%
$50,000 or higher	3.8%	3.2%	to	4.3%
County Population Density				
Frontier	4.1%	2.5%	to	5.6%
Rural	4.9%	3.8%	to	5.9%
Densely-settled rural	5.0%	4.0%	to	5.9%
Semi-urban	5.4%	4.4%	to	6.4%
Urban	4.9%	4.3%	to	5.5%
Disability Status				
Living with a disability	10.2%	9.1%	to	11.3%
Living without a disability	3.3%	2.9%	to	3.7%

Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE. Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2010 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

Obesity Prevalence Trends among Adults in Kansas and the U.S.

The percentage of Kansas adults who are obese has increased significantly over the past decade from 20.8 percent (95% CI: 19.4% to 22.2%) in 2000 to 30.1 percent (95% CI: 28.8% to 31.5%) in 2010 (Figure 1-4). This increase mirrors national data. However, in 2010, the prevalence of obesity was significantly higher among Kansas adults 18 years and older as compared to the U.S. median prevalence (27.5%).

Figure 1-4. Prevalence of obesity among adults 18 years and older, Kansas and the U.S. 2000-2010.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
U.S. (Median)	20.0%	20.9%	21.9%	22.9%	23.2%	24.4%	25.1%	26.3%	26.7%	26.9%	27.5%
Kansas	20.8%	21.6%	22.8%	22.6%	23.2%	23.9%	25.9%	27.7%	28.1%	28.8%	30.1%

Sources: 2000-2010 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, CDC, 2000-2010.
Vertical bars indicate 95% confidence intervals.
Due to changes in the 2011 BRFSS methodology, obesity prevalence trends among adults in Kansas and the U.S. cannot be compared with previous years.

CHAPTER 2: OVERWEIGHT AND OBESITY AMONG KANSAS YOUTH

In contrast to adults, BMI is age- and sex-specific for youth and is often referred to as BMI-for-age.[4] For children and adolescents, BMI is plotted on Centers for Disease Control and Prevention (CDC) BMI-for-age growth charts for either boys or girls to obtain a percentile ranking. The percentile allows comparison of the child's BMI to youth of the same sex and age. Categories and associated ranges for BMI percentiles among youth are shown in Table 2-1.

Table 2-1. Body mass index (BMI) percentile category definitions for youth

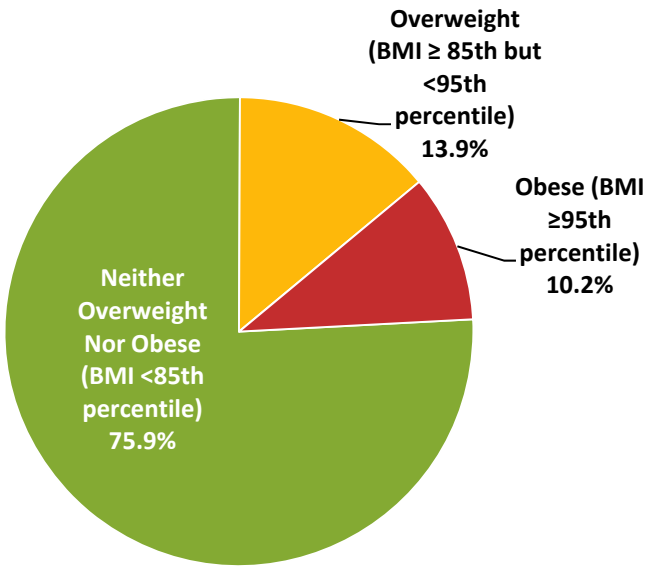
BMI Percentile Category	BMI Percentile Range
Underweight	Less than 5th percentile
Healthy Weight	5th to less than 85th percentile
Overweight	85th to less than 95th percentile
Obese	95th percentile or greater

[4] Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion. About BMI for Children and Teens. Available at: http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html#normal weight ranges. Accessed December 19, 2012.

Overweight and Obesity among High School Students

During the 2010/2011 school year, 13.9 percent (95% CI: 12.2% to 15.7%) of Kansas high school students in grades 9-12 were overweight and 10.2 percent (95% CI: 8.8% to 11.8%) were obese (Figure 2-1). In total, 24.1 percent (95% CI: 21.9% to 26.5%) of Kansas high school students in grades 9-12 were overweight or obese during this time period.

Figure 2-1. Prevalence of overweight and obesity among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who were obese did not differ significantly among gender or age groups or across grade levels (Table 2-1). However, the percentage of Kansas' high school students in grades 9-12 who were obese during this time period was significantly higher among non-Hispanic African Americans (18.1%; 95% confidence interval: 11.4% to 27.6%) compared to non-Hispanic whites (9.1%; 95% confidence interval: 7.6% to 10.8%). There was no significant difference in obesity prevalence between non-Hispanic white and Hispanic (12.5%; 95% CI: 8.8% to 17.5%) students.

Table 2-1. Prevalence of obesity among high school students in grades 9-12, by selected characteristics, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who were obese	95% Confidence Interval
Total	10.2%	8.8% to 11.8%
Gender		
Male	12.3%	10.2% to 14.8%
Female	8.0%	6.2% to 10.3%
Age group		
15 or younger	11.2%	8.3% to 15.1%
16 or 17	9.9%	7.5% to 13.0%
18 or older	9.0%	5.5% to 14.3%
Race and Ethnicity		
White, Non-Hispanic	9.1%	7.6% to 10.8%
African American, Non-Hispanic	18.1%	11.4% to 27.6%
Other/Multi-Race, Non-Hispanic	8.9%	5.5% to 14.1%
Hispanic	12.5%	8.8% to 17.5%
Grade		
9th grade	10.0%	6.9% to 14.4%
10th grade	12.0%	9.5% to 15.1%
11th grade	9.6%	6.9% to 13.1%
12th grade	8.8%	5.5% to 13.9%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who were overweight or obese did not differ significantly among gender, age or race/ethnicity groups or across grade levels (Table 2-2).

Table 2-2. Prevalence of overweight/obesity among high school students in grades 9-12, by selected characteristics, Kansas 2010/2011 school year

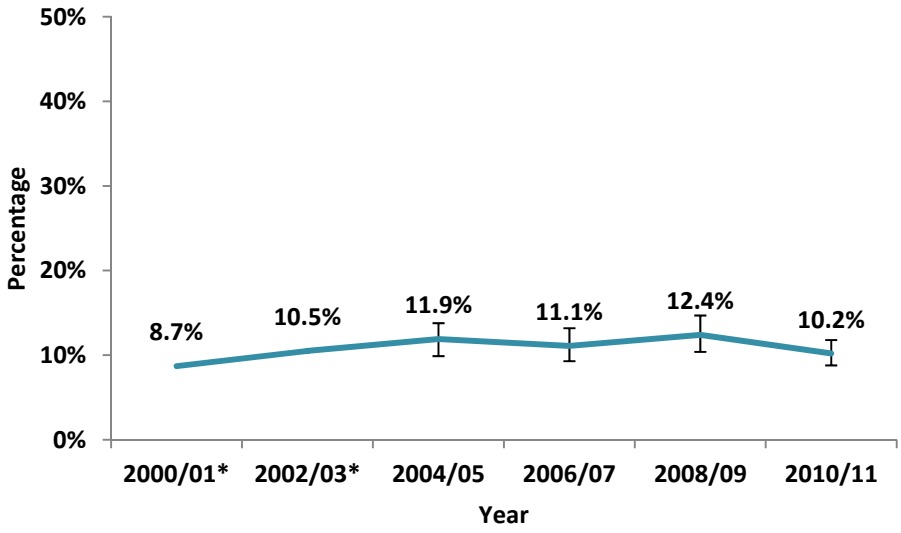
Characteristic	Percentage of high school students in grades 9-12 who were overweight or obese	95% Confidence Interval
Total	24.1%	21.9% to 26.5%
Gender		
Male	27.2%	24.0% to 30.6%
Female	20.8%	17.7% to 24.3%
Age group		
15 or younger	24.4%	19.7% to 29.7%
16 or 17	25.1%	22.0% to 28.6%
18 or older	20.6%	14.3% to 28.7%
Race and Ethnicity		
White, Non-Hispanic	22.0%	19.7% to 24.4%
African American, Non-Hispanic	32.3%	21.5% to 45.3%
Other/Multi-Race, Non-Hispanic	26.3%	19.4% to 34.7%
Hispanic	29.5%	22.6% to 37.4%
Grade		
9th grade	24.5%	19.0% to 31.0%
10th grade	26.3%	22.1% to 31.0%
11th grade	24.7%	21.8% to 27.9%
12th grade	20.3%	15.4% to 26.3%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Obesity Prevalence Trends among High School Students

The percentage of Kansas high school students in grades 9-12 who are obese has remained relatively stable over the past decade from 8.7 percent (unweighted data) during the 2010/2001 school year to 10.2 percent (95% CI: 8.8% to 11.8%) during the 2010/2011 school year (Figure 2-2).

Figure 2-2. Prevalence of obesity among high school students in grades 9-12, Kansas 2000/01-2010/11 school years

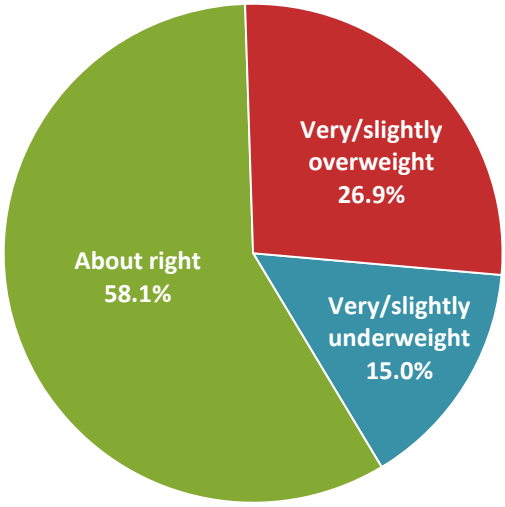


Source: 2001-2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.
Vertical bars indicate 95% confidence intervals.
*Due to low response, prevalence estimates for 2000/01 and 2002/03 are unweighted.

Perceived Weight Status among High School Students

During the 2010/2011 school year, 26.9 percent (95% CI: 24.4% to 29.6%) of Kansas high school students in grades 9-12 described themselves as very or slightly overweight, while 58.1 percent (95% CI: 55.2% to 60.9%) described their weight as about right and 15.0 percent (95% CI: 13.1% to 17.0%) described themselves as very or slightly underweight (Figure 2-3).

Figure 2-3. Percentage of high school students in grades 9-12 who perceive their weight status as overweight, about right or underweight, Kansas 2010/2011 school year



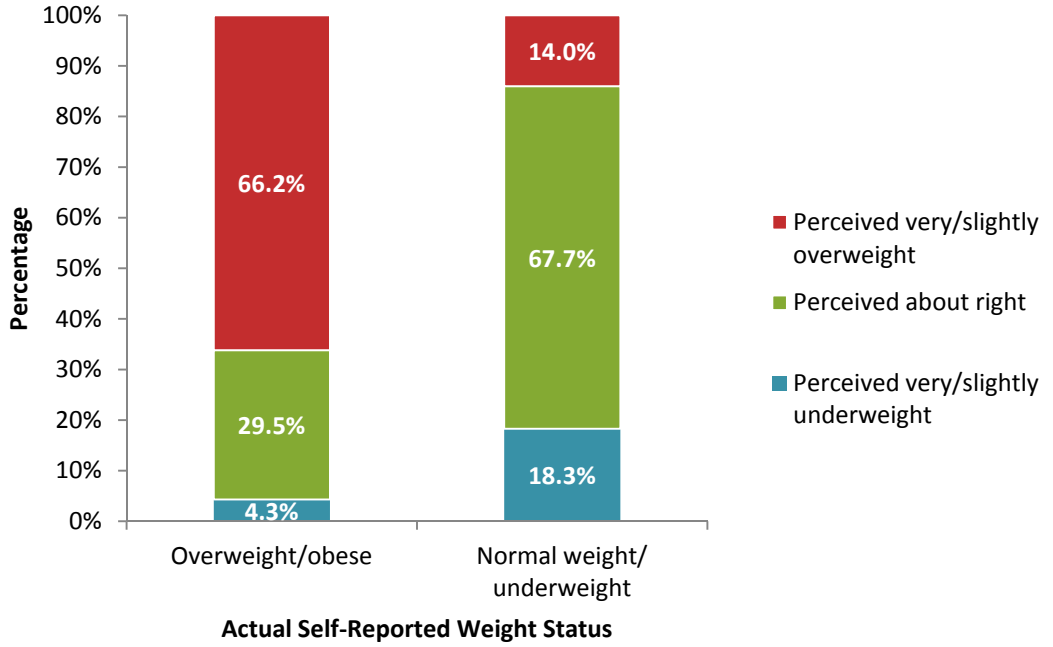
Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who described themselves as very or slightly overweight was significantly higher among females (34.2%; 95% CI: 30.6% to 38.1%) compared to males (20.0%; 95% CI: 17.0% to 23.3%).

There were no significant differences in the percentage of Kansas high school students in grades 9-12 who described themselves as very or slightly overweight among age or race/ethnicity groups or across grade levels.

Only two-thirds (66.2%; 95% CI: 60.3% to 71.7%) of overweight or obese Kansas high school students in grades 9-12 described themselves as very or slightly overweight, while one-third described their weight status as about right (29.5%; 95% CI: 24.5% to 35.0%) or very or slightly underweight (4.3%; 95% CI: 2.8% to 6.5%) (Figure 2-4). Fourteen percent (14.0%; 95% CI: 11.5% to 16.9%) of normal weight or underweight students described themselves as very or slightly overweight.

Figure 2-4. Percentage of high school students in grades 9-12 who perceive their weight status as overweight, about right or underweight, by actual self-reported weight status, Kansas 2010/2011 school year

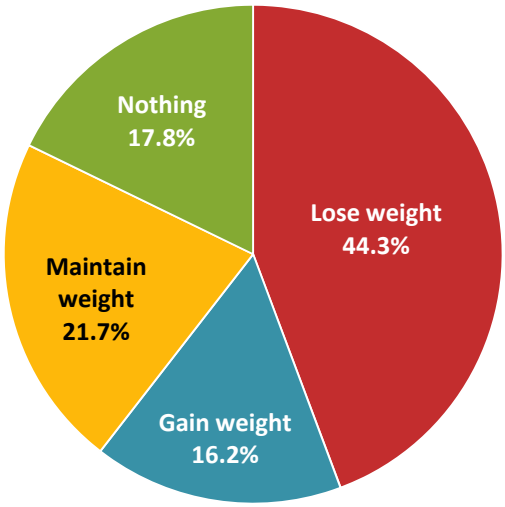


Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Weight Control among High School Students

During the 2010/2011 school year, 44.3 percent (95% CI: 41.5% to 47.1%) of Kansas high school students in grades 9-12 were currently trying to lose weight, while 16.2 percent (95% CI: 14.0% to 18.7%) were trying to gain weight, 21.7 percent (95% CI: 18.9% to 24.7%) were trying to maintain their weight and 17.8 percent (95% CI: 15.5% to 20.5%) were not trying to do anything about their weight (Figure 2-5).

Figure 2-5. Percentage of high school students in grades 9-12 who were trying to lose, gain or maintain their weight, Kansas 2010/2011 school year



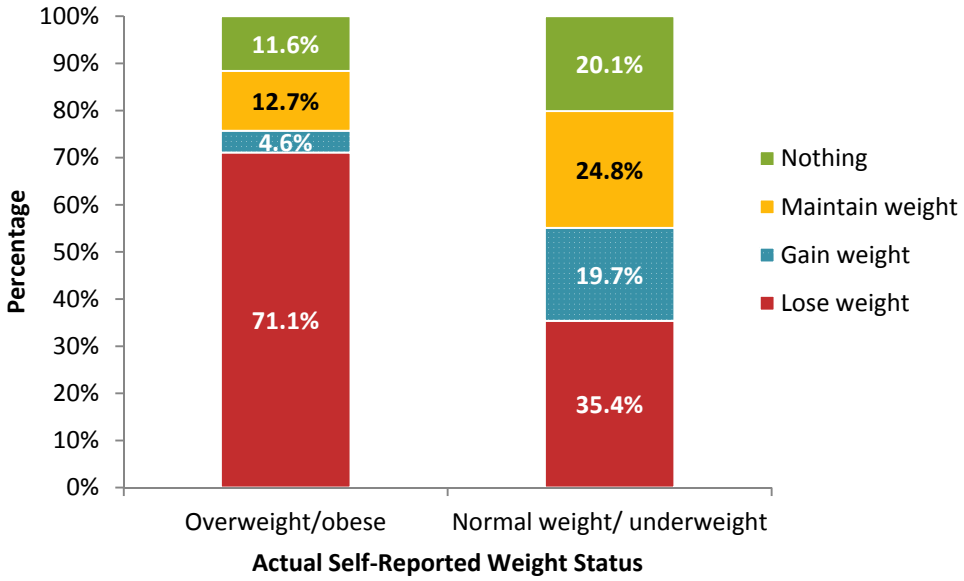
Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who were trying to lose weight was significantly higher among females (59.4%; 95% CI: 55.5% to 63.1%) compared to males (29.9%; 95% CI: 26.7% to 33.2%).

There were no significant differences in the percentage of Kansas high school students in grades 9-12 who were trying to lose weight among age or race/ethnicity groups or across grade levels.

More than two-thirds (71.1%; 95% CI: 66.6% to 75.3%) of overweight or obese Kansas high school students in grades 9-12 were trying to lose weight compared to only one-third (35.4%; 95% CI: 32.4% to 38.7%) of normal or underweight students (Figure 2-6).

Figure 2-6. Percentage of high school students in grades 9-12 who were trying to lose, gain or maintain their weight, by weight status, Kansas 2010/2011 school year

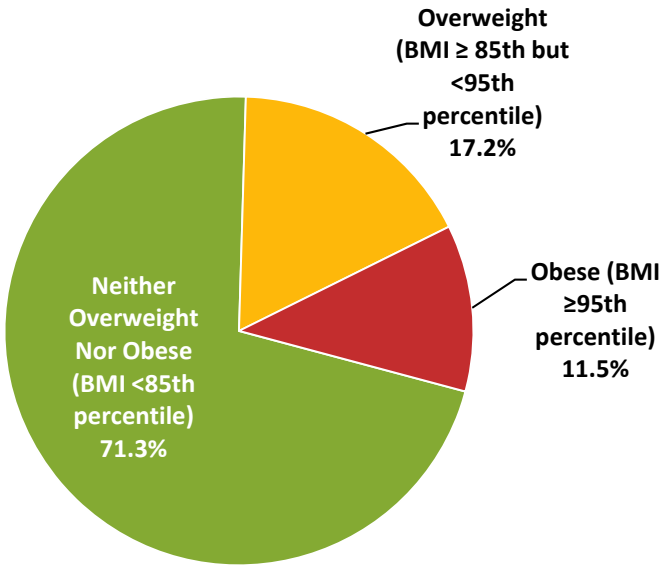


Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Overweight and Obesity among Middle School Students

During the 2011/2012 school year, 17.2 percent (95% CI: 14.2% to 20.7%) of Kansas middle school students in grades 6-8 were overweight and 11.5 percent (95% CI: 8.8% to 14.9%) were obese (Figure 2-7). In total, 28.7 percent (95% CI: 25.5% to 32.2%) of Kansas middle school students in grades 6-8 were overweight or obese during this time period.

Figure 2-7. Prevalence of overweight and obesity among middle school students in grades 6-8, Kansas 2011/2012 school year



Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, Kansas Department of Health and Environment.

During the 2011/2012 school year, the percentage of Kansas middle school students in grades 6-8 who were obese did not differ significantly across gender, age or race/ethnicity groups or across grade levels (Table 2-3).

Table 2-3. Prevalence of obesity among middle school students in grades 6-8, by selected characteristics, Kansas 2011/2012 school year

Characteristic	Percentage of middle school students in grades 6-8 who were obese	95% Confidence Interval
Total	11.5%	8.8% to 14.9%
Gender		
Male	13.5%	10.1% to 17.7%
Female	9.5%	6.2% to 14.2%
Age group		
11 years or younger	17.5%	12.8% to 23.3%
12 years	12.7%	8.2% to 19.1%
13 years	8.9%	5.3% to 14.7%
14 years or older	7.1%	2.9% to 16.3%
Race and Ethnicity		
White, Non-Hispanic	11.4%	8.0% to 15.9%
African American/Other/Multi, Non-Hispanic	10.4%	5.6% to 18.3%
Hispanic	13.3%	7.3% to 22.9%
Grade		
6th grade	15.9%	12.9% to 19.5%
7th grade	10.1%	6.6% to 15.2%
8th grade	9.1%	5.7% to 14.1%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, Kansas Department of Health and Environment.

During the 2011/2012 school year, the percentage of Kansas middle school students in grades 6-8 who were overweight or obese did not differ significantly across gender, age or race/ethnicity groups or across grade levels (Table 2-4).

Table 2-4. Prevalence of overweight/obesity among middle school students in grades 6-8, by selected characteristics, Kansas 2011/2012 school year

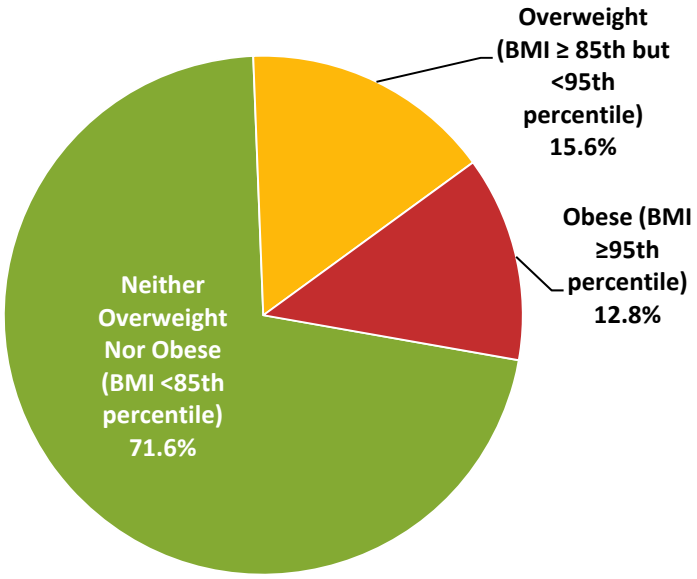
Characteristic	Percentage of middle school students in grades 6-8 who were overweight or obese	95% Confidence Interval
Total	28.7%	25.5% to 32.2%
Gender		
Male	29.7%	24.9% to 35.0%
Female	27.6%	23.5% to 32.2%
Age group		
11 years or younger	32.8%	27.2% to 39.0%
12 years	29.3%	24.5% to 34.5%
13 years	29.4%	22.9% to 36.9%
14 years or older	19.8%	12.1% to 30.6%
Race and Ethnicity		
White, Non-Hispanic	26.6%	21.9% to 32.0%
African American/Other/Multi, Non-Hispanic	34.2%	22.6% to 48.0%
Hispanic	26.0%	19.9% to 33.3%
Grade		
6th grade	30.9%	25.9% to 36.5%
7th grade	28.9%	22.9% to 35.7%
8th grade	26.8%	22.0% to 32.4%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, Kansas Department of Health and Environment.

Overweight and Obesity among Low-Income Children

In 2011, 15.6 percent of low-income children ages 2 to less than 5 years who participated in Kansas' Supplemental Nutrition Program for Women, Infants, and Children (WIC) were overweight and 12.8 percent were obese (Figure 2-8). In total, 28.4 percent of low-income children ages 2 to less than 5 years who participated in Kansas WIC were overweight or obese.

Figure 2-8. Prevalence of overweight and obesity among low-income children ages 2 to less than 5 years who participated in WIC, Kansas 2011



Source: 2011 Pediatric Nutrition Surveillance System (PedNSS), Centers for Disease Control and Prevention.

CHAPTER 3: OBESITY AND CHRONIC DISEASE

Obesity increases the risk for several chronic diseases, including coronary heart disease (CHD), type 2 diabetes, certain cancers, stroke, liver and gallbladder disease and osteoarthritis.[5] Additional adverse health effects of obesity include hypertension, dyslipidemia (e.g. high total cholesterol or high levels of triglycerides), sleep apnea and other respiratory problems, and gynecological problems, including infertility. Obesity has also been shown to increase the risk of depression and, reciprocally, depression has been shown to increase the risk for developing obesity.[6]

Childhood obesity also has immediate and long-term health consequences. Obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure [7]; prediabetes[8]; bone and joint problems, sleep apnea, social stigmatization and poor self-esteem.[9] In addition, children and adolescents who are obese are more likely to be obese as adults, putting them at risk for onset of chronic disease and debilitating conditions later in life.[10] Clearly, the prevention and treatment of overweight and obesity is an important public health goal.

[5] U.S. Department of Health and Human Services. Public Health Service; National Institutes of Health; National Heart, Lung, and Blood Institute. *Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults.* NIH Publication No. 98-4083; 1998.
[6] Luppino FS, de Wit LM, Bouvy PF et al. Overweight, obesity, and depression; a systematic review and meta-analysis of longitudinal studies. *Arch Gen Psychiatry.* 2010;67(3):220-229.
[7] Freedman DS, Zuguo M, Srinivasan SR, Berenson GS, Dietz WH. Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. *Journal of Pediatrics* 2007;150(1):12–17.
[8] Li C, Ford ES, Zhao G, Mokdad AH. Prevalence of pre-diabetes and its association with clustering of cardiometabolic risk factors and hyperinsulinemia among US adolescents: NHANES 2005–2006. *Diabetes Care* 2009;32:342–347.
[9] Daniels SR, Arnett DK, Eckel RH, et al. Overweight in children and adolescents: pathophysiology, consequences, prevention, and treatment. *Circulation* 2005;111;1999–2002.
[10] Freedman DS, Kettel L, Serdula MK, Dietz WH, Srinivasan SR, Berenson GS. The relation of childhood BMI to adult adiposity: the Bogalusa Heart Study. *Pediatrics* 2005;115:22–27.

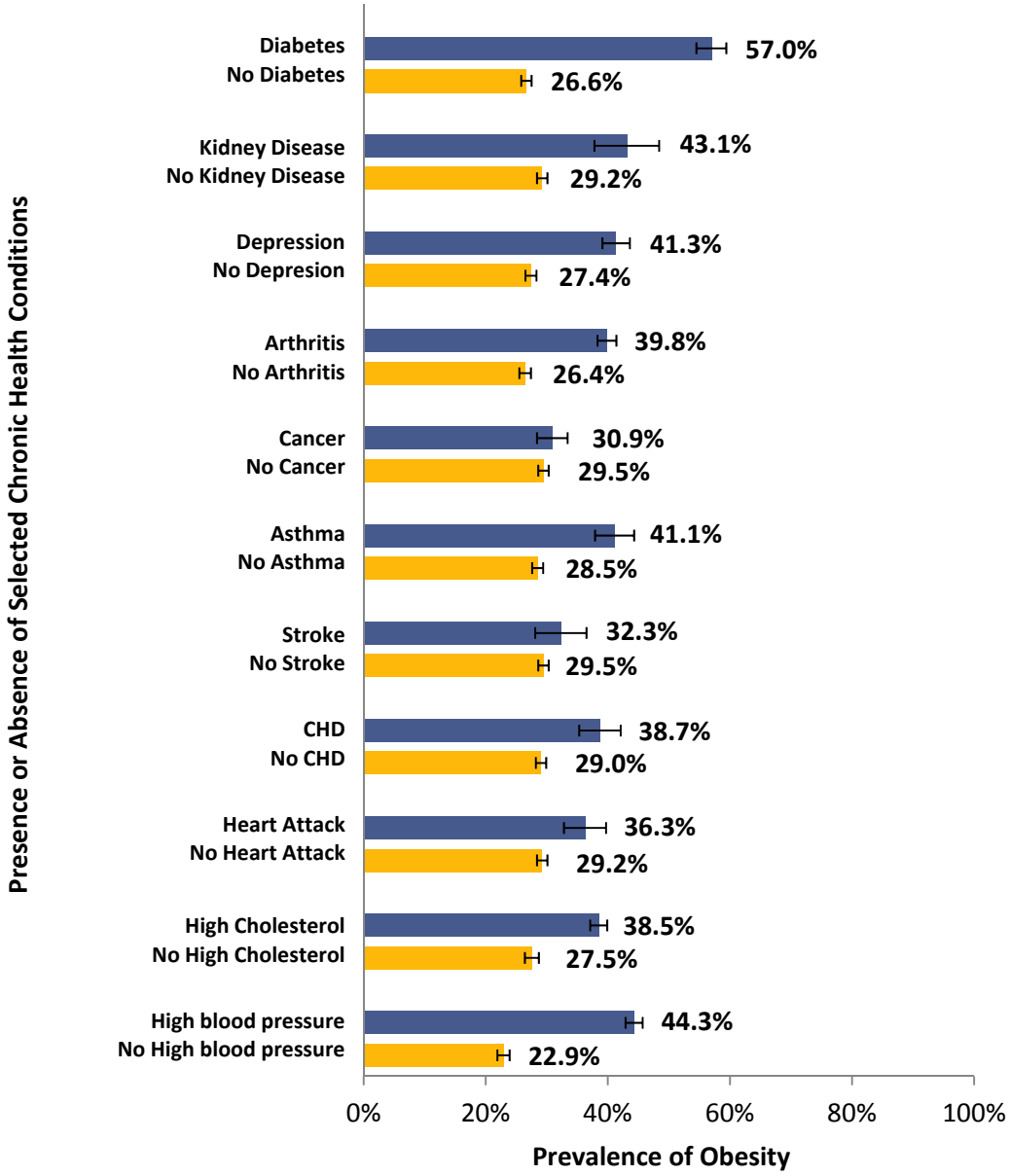
Obesity among Those with Selected Chronic Health Conditions

The prevalence of obesity among Kansans 18 years and older in 2011 was significantly ***higher*** among those with:

- Diabetes (57.0%; 95% CI: 54.5%-59.4%) compared to those without diabetes (26.6%; 95% CI: 25.8%-27.5%);
- Kidney disease (43.1%; 95% CI: 37.8%-48.4%) compared to those without kidney disease (29.2%; 95% CI: 28.4%-30.1%);
- Depression (41.3%; 95% CI: 39.1%-43.6%) compared to those without depression (27.4%; 95% CI: 26.5%-28.3%);
- Arthritis (39.8%; 95% CI: 38.3%-41.4%) compared to those without arthritis (26.4%; 95% CI: 25.5%-27.4%);
- Asthma (41.1%; 95% CI: 37.9%-44.3%) compared to those without asthma (28.5%; 95% CI: 27.6%-29.4%);
- Coronary heart disease (38.7%; 95% CI: 35.3%-42.1%) compared to those without coronary heart disease (29.0%; 95% CI: 28.2%-29.9%);
- History of heart attack (36.3%; 95% CI: 32.8%-39.7%) compared to those without a history of heart attack (29.2%; 95% CI: 28.4%-30.1%);
- High cholesterol (38.5%; 95% CI: 37.1%-39.9%) compared to those without high cholesterol (27.5%; 95% CI: 26.4%-28.7%); and
- High blood pressure (44.3%; 95% CI: 42.9%-45.7%) compared to those without high blood pressure (22.9%; 95% CI: 21.9%-23.9%).

However, the prevalence of obesity among adults 18 years and older did not differ significantly among those with or without a history of cancer or stroke (Figure 3-1).

Figure 3-1. Prevalence of obesity among adults 18 years and older with and without selected chronic health conditions, Kansas 2011



Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.
CHD= coronary heart disease.
Horizontal bars indicate 95% confidence intervals.

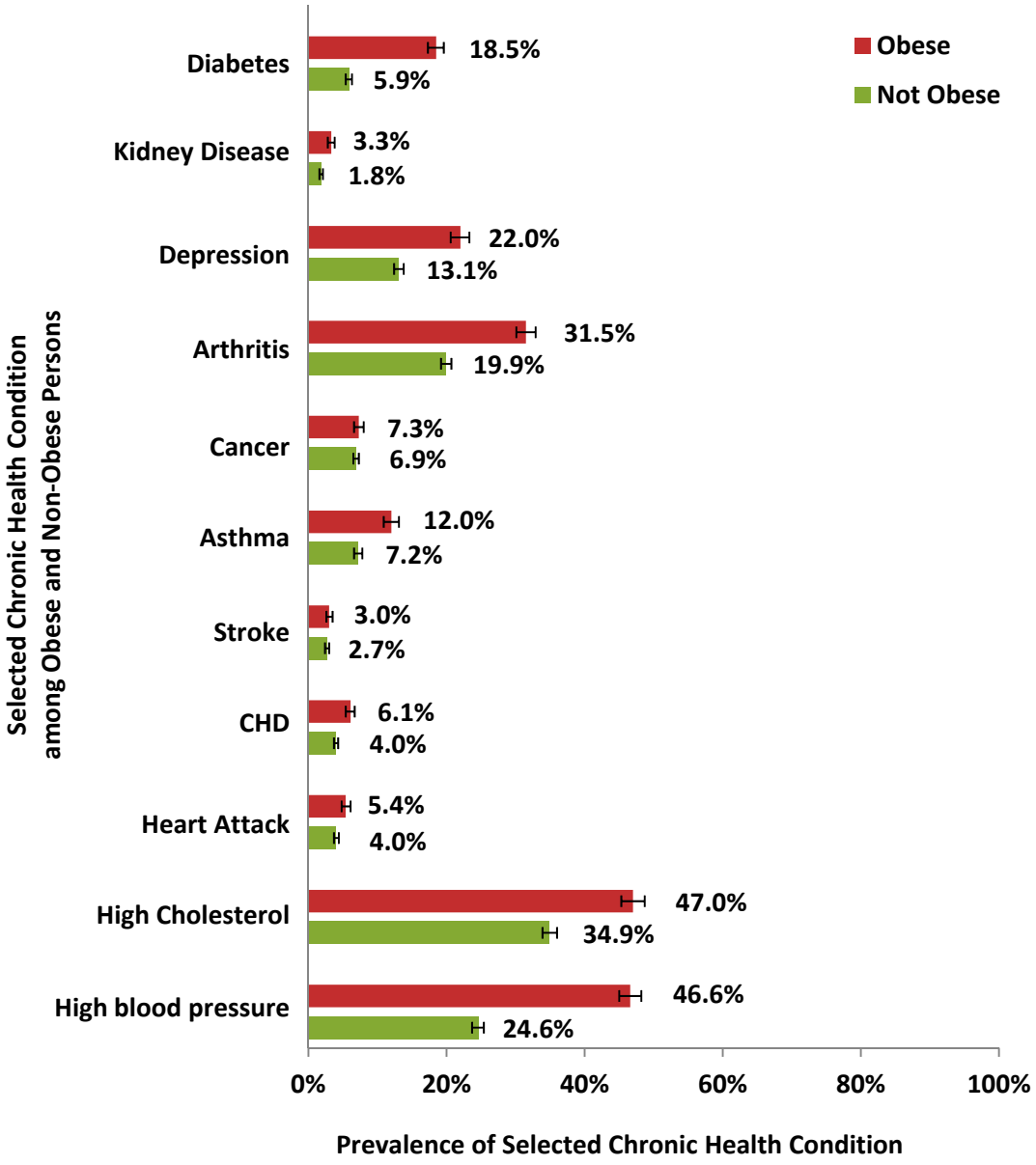
Selected Chronic Health Conditions by Obesity Status

Among Kansans 18 years and older in 2011:

- The prevalence of diabetes was significantly higher among those who were obese (18.5%; 95% CI: 17.3%-19.6%) compared to those who were not obese (5.9%; 95% CI: 5.4%-6.3%);
- The prevalence of kidney disease was significantly higher among those who were obese (3.3%; 95% CI: 2.8%-3.8%) compared to those who were not obese (1.8%; 95% CI: 1.6%-2.1%);
- The prevalence of depression was significantly higher among those who were obese (22.0%; 95% CI: 20.6%-23.3%) compared to those who were not obese (13.1%; 95% CI: 12.4%-13.8%);
- The prevalence of arthritis was significantly higher among those who were obese (31.5%; 95% CI: 30.1%-32.9%) compared to those who were not obese (19.9%; 95% CI: 19.2%-20.7%);
- The prevalence of asthma was significantly higher among those who were obese (12.0%; 95% CI: 10.9%-13.1%) compared to those who were not obese (7.2%; 95% CI: 6.6%-7.8%);
- The prevalence of coronary heart disease (6.1%; 95% CI: 5.4%-6.7%) was significantly higher among those who were obese compared to those who were not obese (4.0%; 95% CI: 3.7%-4.3%);
- The prevalence of history of heart attack was significantly higher among those who were obese (5.4%; 95% CI: 4.8%-6.1%) compared to those who were not obese (4.0%; 95% CI: 3.7%-4.4%);
- The prevalence of high cholesterol was significantly higher among those who were obese (47.0%; 95% CI: 45.3%-48.7%) compared to those who were not obese (34.9%; 95% CI: 33.9%-36.0%); and
- The prevalence of high blood pressure was significantly higher among those who were obese (46.6%; 95% CI: 45.0%-48.2%) compared to those who were not obese (24.6%; 95% CI: 23.7%-25.4%).

However, the prevalence of history of cancer and stroke among adults 18 years and older did not differ significantly by obesity status (Figure 3-2).

Figure 3-2. Prevalence of selected health conditions among adults 18 years and older, by obesity status, Kansas 2011



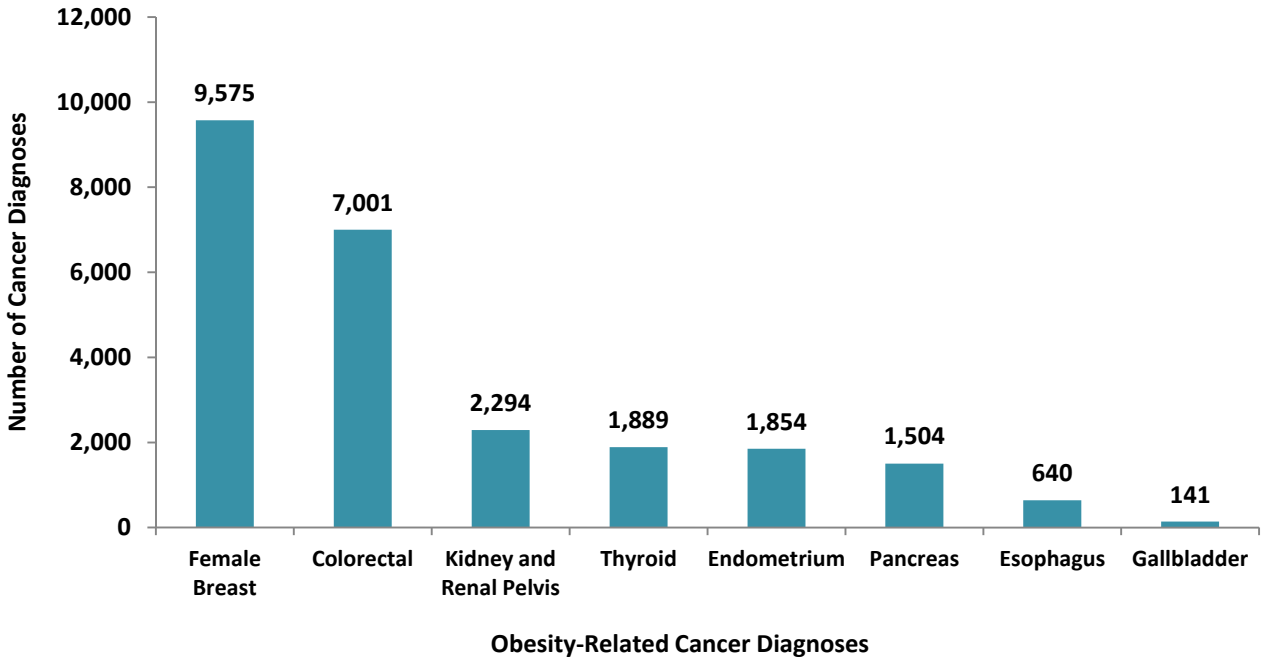
Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.
CHD= coronary heart disease.
Vertical bars indicate 95% confidence intervals.

Incidence of Obesity-Related Cancers

Obesity is associated with increased risk of esophageal, postmenopausal breast, endometrial, colorectal, kidney, pancreatic, gallbladder and thyroid cancer. Although the mechanisms that link obesity and cancer remain unknown, several possible explanations include: excessive hormone production; increased levels of insulin and insulin-like growth-factor; and chronic low-level inflammation.[11]

During the time period 2005-2009, there were nearly 25,000 obesity-related cancers diagnosed among Kansans (Figure 3-3). Although it is unknown which of these specific diagnoses were actually caused by obesity, researchers from the American Institute for Cancer Research (AICR) have estimated that obesity causes approximately 49 percent of endometrial cancers, 35 percent of esophageal cancers, 28 percent of pancreatic cancers, 24 percent of kidney cancers, 21 percent of gallbladder cancers, 17 percent of breast cancers, and 9 percent of colorectal cancers.[12] If we extrapolate this information to Kansas cancer incidence data, an estimated 4,393 cancers diagnosed in Kansas from 2005 to 2009 were caused by obesity.

Figure 3-3. Obesity-related cancer diagnoses, Kansas 2005-2009



Source: 2005-2009 Kansas Cancer Registry.

[11] National Cancer Institute. Obesity and Cancer Risk, 2012. http://www.cancer.gov/cancertopics/factsheet/Risk/obesity

[12] World Cancer Research Fund and the American Institute for Cancer Research (AICR). *Policy and Action for Cancer Prevention*. 2009.

CHAPTER 4: BEHAVIORAL RISK AND PROTECTIVE FACTORS AMONG ADULTS

Body weight is determined by a complex combination of factors, including genetic, behavioral, environmental, and socioeconomic factors. Key modifiable behavioral risk factors for overweight and obesity include physical activity, sedentary behavior (including television viewing and video game and computer use) and diet (including fruit and vegetable consumption and sugar-sweetened beverage intake).

2008 Physical Activity Guidelines for Adults

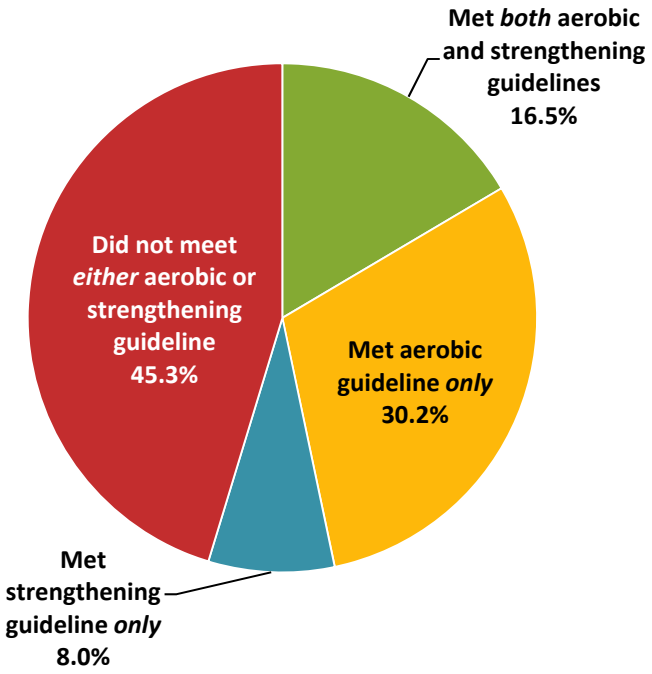
Research has demonstrated strong evidence for a positive association between regular physical activity and several health benefits, including lower risks of coronary heart disease, stroke, high blood pressure, adverse blood lipid profile, type 2 diabetes, colon cancer and breast cancer.[13] The U.S. Department of Health and Human Services' *2008 Physical Activity Guidelines for Americans* recommends that adults do at least 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity *plus* muscle-strengthening activities that involve all major muscle groups two or more times per week.[13]

[13] U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans (2008).

Prevalence of Meeting Physical Activity Guidelines among Adults

In 2011, 16.5 percent (95% CI: 15.8% to 17.3%) of Kansas adults 18 years and older met physical activity guidelines (i.e. *both* aerobic and strengthening guidelines). In contrast, 83.5 percent (95% CI: 82.7% to 84.2%) participated in an insufficient amount of physical activity, or did not participate in physical activity at all, and thus did not meet physical activity guidelines. Specifically, 30.2 percent (95% CI: 29.3% to 31.0%) met the aerobic guideline *only*, 8.0 percent (95% CI: 7.5% to 8.6%) met the strengthening guideline *only* and 45.3 percent (95% CI: 44.4% to 46.2%) did not meet *either* the aerobic or strengthening guideline.

Figure 4-1. Prevalence of meeting physical activity guidelines among adults 18 years and older, Kansas 2011



Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.
Aerobic guideline is defined as 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Strengthening guideline is defined as muscle-strengthening activities that involve all major muscle groups two or more times per week. Meeting physical activity guidelines is defined as meeting both aerobic and strengthening guidelines.

The percentage of Kansans 18 years and older who met physical activity guidelines in 2011 was significantly ***lower*** among:

- Females (15.2%; 95% CI: 14.3% to 16.1%) compared to males (17.9%; 95% CI: 16.8% to 19.1%);
- Kansans aged 25 years and older compared to persons aged 18 to 24 years (23.7%; 95% CI: 20.4% to 26.9%);
- Those with less than a college graduate education compared to college graduates (23.1%; 95% CI: 21.8% to 24.3%);
- Persons whose annual household income was less than $50,000 compared to those whose annual household income was $50,000 or higher (20.9%; 95% CI: 19.7% to 22.1%);
- Persons who resided in less population-dense counties compared to those who resided in urban counties (19.0%; 95% CI: 17.9% to 20.0%);
- Persons living with a disability (12.2%; 95% CI: 11.0% to 13.4%) compared to those living without a disability (18.0%; 95% CI: 17.1% to 18.8%); and
- Persons who were obese (11.8%; 95% CI: 10.6% to 13.0%) compared to those who were not obese (19.1%; 95% CI: 18.2% to 20.1%).

However, the percentage of Kansas adults 18 years and older who met physical activity guidelines in 2011 did not differ significantly across race/ethnicity groups (Table 4-1).

Table 4-1. Percentage of adults 18 years and older who met physical activity guidelines, by selected characteristics, Kansas 2011

Characteristic	Percentage of adults 18 years and older who met physical activity guidelines	95% Confidence Interval		
Total	16.5%	15.8%	to	17.3%
Gender				
Male	17.9%	16.8%	to	19.1%
Female	15.2%	14.3%	to	16.1%
Age group				
18-24	23.7%	20.4%	to	26.9%
25-34	18.3%	16.2%	to	20.3%
35-44	16.4%	14.7%	to	18.1%
45-64	15.0%	14.1%	to	15.9%
65 and older	12.7%	11.7%	to	13.6%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	16.7%	15.9%	to	17.5%
African American, Non-Hispanic	16.6%	12.5%	to	20.7%
Other/Multi-Race, Non-Hispanic	19.8%	15.8%	to	23.8%
Hispanic	14.5%	11.8%	to	17.1%
Education				
Less than high school	10.5%	7.9%	to	13.1%
High school graduate or G.E.D.	12.1%	10.8%	to	13.4%
Some college	17.1%	15.7%	to	18.4%
College graduate	23.1%	21.8%	to	24.3%
Annual Household Income				
Less than $15,000	11.1%	8.6%	to	13.6%
$15,000 to $24,999	11.6%	9.9%	to	13.3%
$25,000 to $34,999	15.1%	13.0%	to	17.3%
$35,000 to $49,999	16.8%	14.9%	to	18.6%
$50,000 or higher	20.9%	19.7%	to	22.1%
County Population Density				
Frontier	10.7%	8.2%	to	13.2%
Rural	13.8%	11.8%	to	15.7%
Densely-settled rural	12.5%	10.9%	to	14.1%
Semi-urban	16.1%	14.4%	to	17.9%
Urban	19.0%	17.9%	to	20.0%
Disability Status				
Living with a disability	12.2%	11.0%	to	13.4%
Living without a disability	18.0%	17.1%	to	18.8%
Obesity Status				
Obese	11.8%	10.6%	to	13.0%
Not obese	19.1%	18.2%	to	20.1%

Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.
Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for

details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2010 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile). Meeting physical activity guidelines is defined as 150 minutes a week of moderate-intensity aerobic activity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity *plus* muscle-strengthening activities that involve all major muscle groups two or more times per week.

2010 Dietary Guidelines for Americans

Fruit and vegetable intake (at least 2 ½ cups) is associated with reduced risk of many chronic diseases, including heart attack, stroke and certain types of cancer.[14] Most fruits and vegetables, when prepared without added fats or sugars, are also relatively low in calories and can help adults and children achieve and maintain a healthy weight. In addition to its recommendation to increase fruit and vegetable intake, the *2010 Dietary Guidelines for Americans* recommend consuming at least half of all grains as whole grains; increasing intake of fat-free or low-fat milk and milk products; and choosing a variety of protein foods, including seafood, lean meat and poultry, eggs, beans and peas, soy products and unsalted nuts and seeds. Additional recommendations include reducing daily intake of sodium, saturated fatty acids and dietary cholesterol, and reducing the intake of calories from solid fats and added sugars, including sugar-sweetened beverages.[14]

[14] U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010.

Fruit and Vegetable Consumption among Adults

In 2011, 41.4 percent (95% CI: 40.5% to 42.4%) of Kansas adults 18 years and older consumed fruit less than 1 time per day and 22.3 percent (95% CI: 21.4% to 23.1%) consumed vegetables less than 1 time per day (Table 4-2).

The percentage of Kansans 18 years and older who consumed fruit less than 1 time per day was significantly ***higher*** among:

- Males (47.6%; 95% CI: 46.1% to 49.0%) compared to females (35.5%; 95% CI: 34.4% to 36.7%);
- Kansans aged 18 to 64 years compared to persons aged 65 years and older (30.6%; 95% CI: 29.2% to 31.9%);
- Those with less than a college graduate education compared to college graduates (32.2%; 95% CI: 30.8% to 33.5%);
- Persons whose annual household income was less than $50,000 compared to those whose annual household income was $50,000 or higher (37.9%; 95% CI: 36.5% to 39.3%);
- Persons who resided in densely-settled rural counties (44.3%; 95% CI: 42.1% to 46.5%) compared to those who resided in urban counties (39.7%; 95% CI: 38.4% to 41.0%); and
- Persons who were obese (46.6%; 95% CI: 45.0% to 48.3%) compared to those who were not obese (39.8%; 95% CI: 38.6% to 40.9%).

Similarly, the percentage of Kansans 18 years and older who consumed vegetables less than 1 time per day was significantly ***higher*** among:

- Males (25.3%; 95% CI: 24.0% to 26.6%) compared to females (19.4%; 95% CI: 18.4% to 20.3%);
- Kansans aged 18 to 34 years compared to persons aged 65 years and older (19.6%; 95% CI: 18.4% to 20.8%);
- Those with less than a college graduate education compared to college graduates (15.4%; 95% CI: 14.3% to 16.5%);
- Persons whose annual household income was less than $35,000 compared to those whose annual household income was $50,000 or higher (18.3%; 95% CI: 17.1% to 19.4%); and
- Persons who resided in densely-settled rural and semi-urban counties compared to those who resided in urban counties (20.8%; 95% CI: 19.7% to 21.9%).

The percentage who consumed fruit or vegetables less than 1 time per day did not differ significantly across race/ethnicity groups or by disability status. Additionally, the percentage who consumed vegetables less than 1 time per day did not differ significantly by obesity status.

Table 4-2. Percentage of adults 18 years and older who consumed fruits or vegetables <1 time per day, by selected characteristics, Kansas 2011

Characteristic	Percentage who ate fruit < 1 time/day	95% Confidence Interval	Percentage who ate veg. < 1 time/day	95% Confidence Interval
Total	41.4%	40.5% to 42.4%	22.3%	21.4% to 23.1%
Gender				
Male	47.6%	46.1% to 49.0%	25.3%	24.0% to 26.6%
Female	35.5%	34.4% to 36.7%	19.4%	18.4% to 20.3%
Age group				
18-24	45.1%	41.4% to 48.8%	29.3%	25.8% to 32.7%
25-34	42.6%	40.0% to 45.2%	23.6%	21.3% to 25.8%
35-44	45.9%	43.6% to 48.2%	21.6%	19.6% to 23.6%
45-64	42.9%	41.6% to 44.1%	20.5%	19.5% to 21.6%
65 and older	30.6%	29.2% to 31.9%	19.6%	18.4% to 20.8%
Race and Ethnicity (age-adjusted)				
White, Non-Hispanic	42.1%	41.1% to 43.1%	21.7%	20.8% to 22.6%
African American, Non-Hispanic	42.3%	37.3% to 47.3%	36.2%	31.3% to 41.2%
Other/Multi-Race, Non-Hispanic	40.1%	35.4% to 44.9%	18.6%	14.4% to 22.8%
Hispanic	38.3%	34.5% to 42.1%	23.1%	19.7% to 26.4%
Education				
Less than high school	48.7%	45.1% to 52.4%	31.8%	28.4% to 35.2%
High school graduate or G.E.D.	46.8%	45.0% to 48.5%	26.1%	24.5% to 27.6%
Some college	42.0%	40.3% to 43.7%	21.5%	20.0% to 22.9%
College graduate	32.2%	30.8% to 33.5%	15.4%	14.3% to 16.5%
Annual Household Income				
Less than $15,000	49.3%	45.7% to 52.9%	33.6%	30.1% to 37.1%
$15,000 to $24,999	45.3%	42.8% to 47.8%	26.1%	23.9% to 28.3%
$25,000 to $34,999	42.7%	40.0% to 45.4%	22.2%	19.8% to 24.6%
$35,000 to $49,999	41.7%	39.4% to 44.0%	19.6%	17.7% to 21.5%
$50,000 or higher	37.9%	36.5% to 39.3%	18.3%	17.1% to 19.4%
County Population Density				
Frontier	43.4%	39.6% to 47.1%	21.3%	18.2% to 24.5%
Rural	42.5%	39.9% to 45.2%	21.3%	19.0% to 23.6%
Densely-settled rural	44.3%	42.1% to 46.5%	24.6%	22.5% to 26.7%
Semi-urban	43.2%	40.8% to 45.5%	25.7%	23.5% to 27.9%
Urban	39.7%	38.4% to 41.0%	20.8%	19.7% to 21.9%
Disability Status				
Living with a disability	42.3%	40.6% to 44.0%	23.4%	21.9% to 24.9%
Living without a disability	41.0%	39.9% to 42.1%	21.8%	20.9% to 22.8%
Obesity Status				
Obese	46.6%	45.0% to 48.3%	24.1%	22.6% to 25.5%
Not obese	39.8%	38.6% to 40.9%	21.7%	20.6% to 22.7%

Source: 2011 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.
Prevalence estimates for race and ethnicity were age-adjusted to the U.S. 2000 standard population. See Technical Appendix for

details on how prevalence estimates were calculated. County population density peer groups are based on the population for each county in the 2010 population and are defined as follows: Frontier (fewer than 6 persons per square mile), Rural (6 to 19.9 persons per square mile), Densely-Settled Rural (20 to 39.9 persons per square mile), Semi-Urban (40 to 149.9 persons per square mile), and Urban (150 or more persons per square mile).

CHAPTER 5: BEHAVIORAL RISK AND PROTECTIVE FACTORS AMONG YOUTH

2008 Physical Activity Guidelines for Children and Adolescents

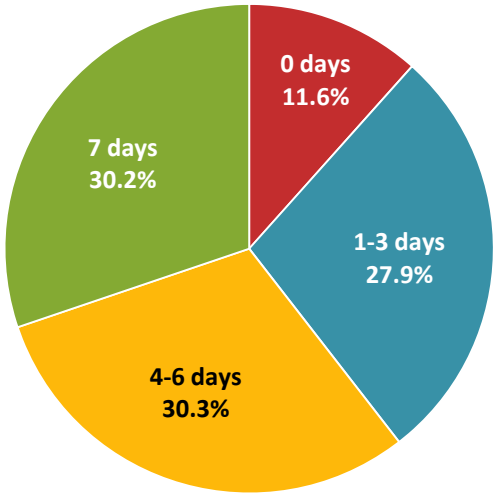
As in adults, regular physical activity in youth promotes health and fitness. Compared to those who are inactive, physically active children and adolescents have higher levels of cardiorespiratory fitness, stronger muscles, lower body fatness, stronger bones, and reduced symptoms of anxiety and depression.[15] The U.S. Department of Health and Human Services' *2008 Physical Activity Guidelines for Americans* recommends that children and adolescents do 60 minutes or more of physical activity daily, including vigorous-intensity aerobic activity, muscle-strengthening activity and bone-strengthening activity on at least 3 days a week.[15]

[15] U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans (2008).

Prevalence of Meeting Physical Activity Guidelines among High School Students

During the 2010/2011 school year, nearly one-third (30.2%; 95% CI: 27.7% to 32.7%) of Kansas high school students in grade 9-12 met physical activity guidelines (i.e. were physically active for at least 60 minutes daily) (Figure 5-1). However, 11.6 percent (95% CI: 9.8% to 13.7%) did not participate in physical activity for at least 60 minutes on *any* day in the past week.

Figure 5-1. Frequency in past week of participating in physical activity for at least 60 minutes among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.
Physical activity guideline is defined as 60 minutes or more of physical activity 7 days a week (daily).

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who met physical activity guidelines did not differ significantly among age, race/ethnicity or weight status groups or across grade levels (Table 5-1). However, the percentage of Kansas high school students in grades 9-12 who met physical activity guidelines during this time period was significantly higher among males (40.5%; 95% confidence interval: 37.0% to 44.1%) compared to females (19.5%; 95% CI: 16.9% to 22.3%).

Table 5-1. Percentage of high school students in grades 9-12 who met physical activity guidelines, by selected characteristics, Kansas 2010/2011 school year

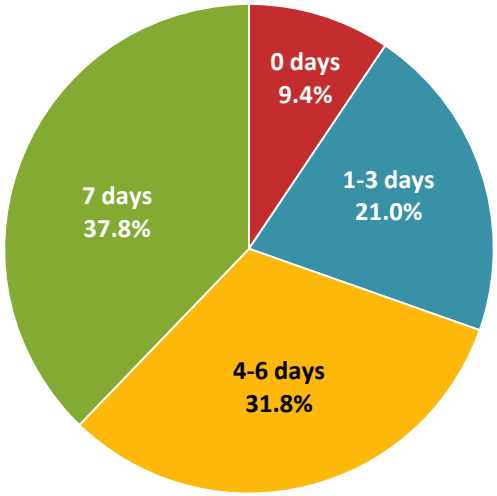
Characteristic	Percentage of high school students in grades 9-12 who met physical activity guidelines	95% Confidence Interval
Total	30.2%	27.7% to 32.7%
Gender		
Male	40.5%	37.0% to 44.1%
Female	19.5%	16.9% to 22.3%
Age group		
15 years or younger	33.9%	29.2% to 38.9%
16 or 17 years old	27.7%	24.6% to 31.0%
18 years or older	30.6%	23.9% to 38.2%
Race and Ethnicity		
White, Non-Hispanic	31.0%	28.5% to 33.6%
African American, Non-Hispanic	29.8%	22.0% to 38.8%
Other/Multi-Race, Non-Hispanic	25.8%	19.8% to 33.0%
Hispanic	28.5%	23.0% to 34.7%
Grade		
9th grade	34.1%	28.0% to 40.8%
10th grade	31.8%	28.6% to 35.2%
11th grade	25.0%	20.9% to 29.6%
12th grade	29.5%	24.6% to 34.9%
Weight Status		
Overweight/Obese	28.2%	23.8% to 33.1%
Neither overweight nor obese	31.4%	28.5% to 34.4%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.
Physical activity guideline is defined as 60 minutes or more of physical activity 7 days a week (daily).

Prevalence of Meeting Physical Activity Guidelines among Middle School Students

During the 2011/2012 school year, more than one-third (37.8%; 95% CI: 33.1% to 42.7%) of Kansas middle school students in grades 6-8 met physical activity guidelines (i.e. were physically active for at least 60 minutes daily) (Figure 5-2). However, 9.4 percent (95% CI: 7.5% to 11.8%) did not participate in physical activity for at least 60 minutes on *any* day in the past week.

Figure 5-2. Frequency in past week of participating in physical activity for at least 60 minutes among middle school students in grades 6-8, Kansas 2011/2012 school year



Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.
Physical activity guideline is defined as 60 minutes or more of physical activity 7 days a week (daily).

During the 2011/2012 school year, the percentage of Kansas middle school students in grades 6-8 who met physical activity guidelines did not differ significantly among age, race/ethnicity or weight status groups or across grade levels (Table 5-2). However, the percentage of Kansas middle school students in grades 6-8 who met physical activity guidelines during this time period was significantly higher among males (44.4%; 95% confidence interval: 39.2% to 49.8%) compared to females (30.4%; 95% CI: 24.2% to 37.3%) and among students who were neither overweight nor obese (40.7%; 95% CI: 35.2% to 46.4%) compared to those who were overweight or obese (26.4%; 95% CI: 19.8% to 34.3%).

Table 5-2. Percentage of middle school students in grades 6-8 who met physical activity guidelines, by selected characteristics, Kansas 2011/2012 school year

Characteristic	Percentage of middle school students in grades 6-8 who met physical activity guidelines	95% Confidence Interval
Total	37.8%	33.1% to 42.7%
Gender		
Male	44.4%	39.2% to 49.8%
Female	30.4%	24.2% to 37.3%
Age group		
11 years or younger	36.1%	30.3% to 42.4%
12 years old	34.1%	26.2% to 43.0%
13 years old	41.5%	34.9% to 48.3%
14 years or older	40.0%	31.9% to 48.8%
Race and Ethnicity		
White, Non-Hispanic	36.7%	32.6% to 41.0%
African American/Other/Multi, Non-Hispanic	40.3%	29.8% to 51.9%
Hispanic	42.6%	33.7% to 52.1%
Grade		
6th grade	35.5%	31.5% to 39.6%
7th grade	37.4%	27.8% to 48.2%
8th grade	39.5%	33.2% to 46.0%
Weight Status		
Overweight/obese	26.4%	19.8% to 34.3%
Neither overweight nor obese	40.7%	35.2% to 46.4%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.
Physical activity guideline is defined as 60 minutes or more of physical activity 7 days a week (daily).

Entertainment Media Use Guidelines for Children and Adolescents

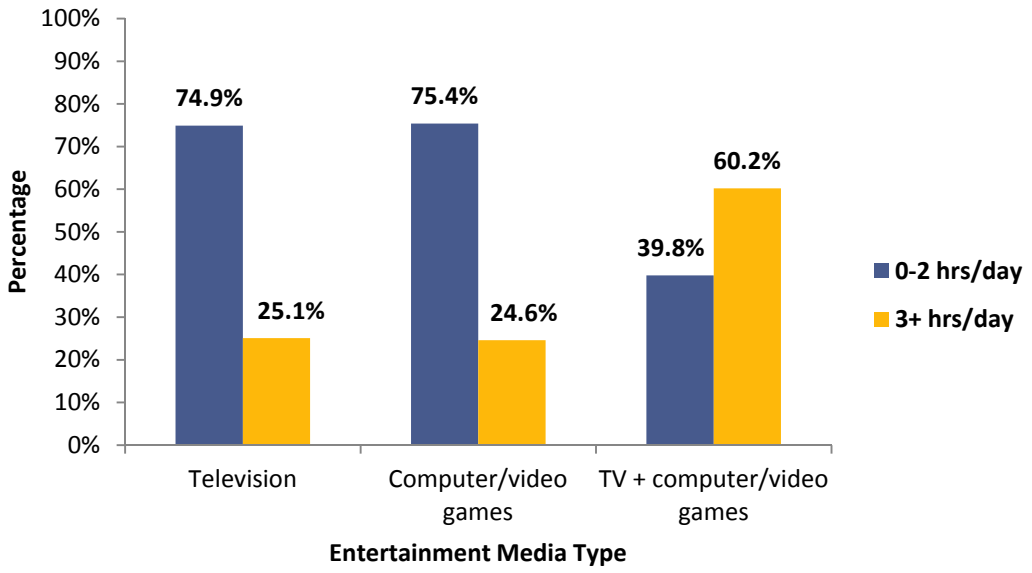
Nationally, youth ages 8-18 years spend on average 7.5 hours a day using entertainment media, including television, computers, video games, cell phones and movies.[16] Research has demonstrated a positive association between screen time and childhood obesity.[17] Possible mechanisms for this association include displacement of physical activity and increased caloric intake due to snacking and eating meals while watching TV and unhealthy foods choices prompted by exposure to food advertising.[17] The American Academy of Pediatrics (AAP) recommends that parents limit youth's total entertainment media time to no more than 1 to 2 hours of quality programming per day.[18] The Centers for Disease Control and Prevention (CDC) endorses the AAP recommendation.[19]

[16] Rideout VJ, Foehr UG, Roberts DF. Generation of M2 media in the lives of 8-18 years olds. A Kaiser Family Foundation study; 2010.
[17] Robinson TN. Television viewing and childhood obesity. *Pediatr Clin North Am* 2001;48(4):1017-1025.
[18] American Academy of Pediatrics. Children, adolescents, and television. *Pedatrics* 2001;107(2):423-426.
[19] Centers for Disease Control and Prevention (CDC). Overweight and obesity: strategies and solutions. http://www.cdc.gov/obesity/childhood/solutions.html. Accessed January 11, 2013.

Entertainment Media Use among High School Students

During the 2010/2011 school year, 25.1 percent (95% CI: 23.0% to 27.3%) of Kansas high school students in grades 9-12 watched TV for 3 or more hours per day and 24.6 percent (95% CI: 21.1% to 28.5%) played video or computer games or used a computer for something other than school work for 3 or more hours per day (Figure 5-3). In total, 3 in 5 (60.2%; 95% CI: 56.9% to 63.4%) Kansas high school students in grade 9-12 watched television *and* played video or computer games or used a computer for something other than school work for 3 or more hours per day.

Figure 5-3. Frequency per day of entertainment media use among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.
Entertainment media guideline is defined as 0-2 hours of television, video or computer games or computer use for something other than school work, or a combination thereof, per day.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who watched television 3 or more hours per day did not differ significantly among age groups or across grade levels (Table 5-3). However, the percentage of Kansas high school students in grades 9-12 who watched television 3 or more hours per day during this time period was significantly higher among Hispanics (32.6%; 95% CI: 26.8% to 39.0%) compared to non-Hispanic whites (23.3%; 95% CI: 21.6% to 25.2%) and among overweight/obese students (34.7%; 95% CI: 28.9% to 41.0%) compared to students who were normal or underweight (21.9%; 95% CI: 19.9% to 24.2%).

Table 5-3. Percentage of high school students in grades 9-12 who watched television for 3 or more hours per day, by selected characteristics, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who watched TV 3+ hrs/day	95% Confidence Interval
Total	25.1%	23.0% to 27.3%
Gender		
Male	26.8%	23.5% to 30.4%
Female	23.3%	20.5% to 26.4%
Age group		
15 years or younger	26.4%	21.5% to 32.1%
16 or 17 years old	24.4%	21.8% to 27.3%
18 years or older	24.3%	17.2% to 33.1%
Race and Ethnicity		
White, Non-Hispanic	23.3%	21.6% to 25.2%
African American, Non-Hispanic	31.2%	19.4% to 46.1%
Other/Multi-Race, Non-Hispanic	25.5%	18.5% to 34.1%
Hispanic	32.6%	26.8% to 39.0%
Grade		
9th grade	27.8%	22.7% to 33.6%
10th grade	22.5%	18.1% to 27.7%
11th grade	24.9%	21.3% to 28.9%
12th grade	24.5%	17.8% to 32.7%
Weight Status		
Overweight/Obese	34.7%	28.9% to 41.0%
Neither overweight nor obese	21.9%	19.9% to 24.2%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

During the 2010/2011 school year, the percentage of Kansas high school students in grades 9-12 who played video or computer games or used a computer for something other than school work for 3 or more hours per day did not differ significantly among age, race/ethnicity or weight status groups or across grade levels (Table 5-4). However, the percentage of Kansas high school students in grades 9-12 who played video or computer games or used a computer for something other than school work for 3 or more hours per day during this time period was significantly higher among males (29.0%; 95% confidence interval: 24.9% to 33.5%) compared to females (20.1%; 95% CI: 16.5% to 24.3%).

Table 5-4. Percentage of high school students in grades 9-12 who played video or computer games or used a computer for something other than school work for 3 or more hours per day by selected characteristics, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who played computer or video games* 3+ hrs/day	95% Confidence Interval
Total	24.6%	21.1% to 28.5%
Gender		
Male	29.0%	24.9% to 33.5%
Female	20.1%	16.5% to 24.3%
Age group		
15 years or younger	26.9%	22.6% to 31.7%
16 or 17 years old	25.1%	21.8% to 28.8%
18 years or older	18.7%	11.5% to 28.9%
Race and Ethnicity		
White, Non-Hispanic	23.7%	19.8% to 28.0%
African American, Non-Hispanic	26.5%	16.9% to 39.0%
Other/Multi-Race, Non-Hispanic	29.0%	19.8% to 40.2%
Hispanic	28.1%	22.4% to 34.5%
Grade		
9th grade	28.8%	23.8% to 34.4%
10th grade	23.7%	18.6% to 29.7%
11th grade	23.7%	19.5% to 28.5%
12th grade	21.8%	14.6% to 31.3%
Weight Status		
Overweight/Obese	26.0%	21.1% to 31.6%
Neither overweight nor obese	24.2%	20.5% to 28.2%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.
*Or used a computer for something other than school work.

2010 Dietary Guidelines for Americans

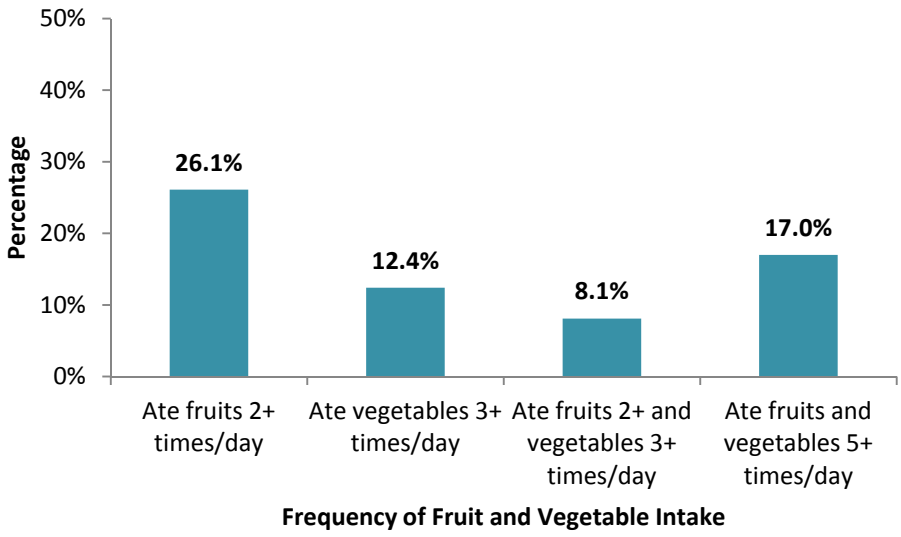
Similar to recommendations for adults, the *2010 Dietary Guidelines for Americans* recommends that children and adolescents consume a diet rich in fruits and vegetables, whole grains, and fat-free and low-fat dairy products while limiting intake of solid fats, cholesterol, sodium, added sugars and refined grains.[14] Individual recommendations specific to fruit and vegetable consumption are based on age, gender and activity level and can be calculated online using the Centers for Disease Control and Prevention (CDC) Fruit and Vegetable Calculator.[20] Eating a healthy breakfast daily is also recommended due to its association with improved memory, reduced school absenteeism and improved mood.[21,22,23]

[20] Centers for Disease Control and Prevention (CDC). How many fruits and vegetables do you need? http://www.cdc.gov/nutrition/everyone/fruitsvegetables/howmany.html. Accessed January 11, 2012.
[21] Taras HL. Nutrition and student performance at school. *Journal of School Health* 2005;75:199-213.
[22] Rampersaud GC, Pereira MA, Girard BL, Adams J, Metzl JD. Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *JADA* 2005;105:743-760.
[23] Hoyland A, Dye L, Lawton CL. A systematic review of the effect of breakfast on cognitive performance of children and adolescents. *Nutrition Research Reviews* 2009;22:220-243.

Fruit and Vegetable Consumption among High School Students

During the 2010/2011 school year, approximately one-quarter (26.1%; 95% CI: 23.7% to 28.8%) of Kansas high school students in grade 9-12 consumed fruits 2 or more times per day in the past week and 12.4 percent (95% CI: 10.8% to 14.1%) consumed vegetables 3 or more times per day in the past week (Figure 5-4). However, only 8.1 percent (95% CI: 6.9% to 9.6%) consumed fruits 2 or more times per day *and* vegetables 3 or more times per day in the past week. About 17.0 percent (95% CI: 15.1% to 19.1%) ate fruits and vegetables 5 or more times per day in the past week.

Figure 5-4. Frequency of fruit and vegetable consumption among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

There were no significant differences in eating fruits 2 or more times per day and vegetables 3 or more times per day in the past week among gender, age or race/ethnicity groups, or across grade levels or by obesity status.. Similarly, there were not significant differences in eating fruits and vegetables 5 or more times per day in the past week among gender, age or race/ethnicity groups, or across grade levels or by obesity status (Table 5-5).

Table 5-5. Percentage of high school students in grades 9-12 who ate fruits and vegetables 5 or more times per day in the past week by selected characteristics, Kansas 2010/2011 school year

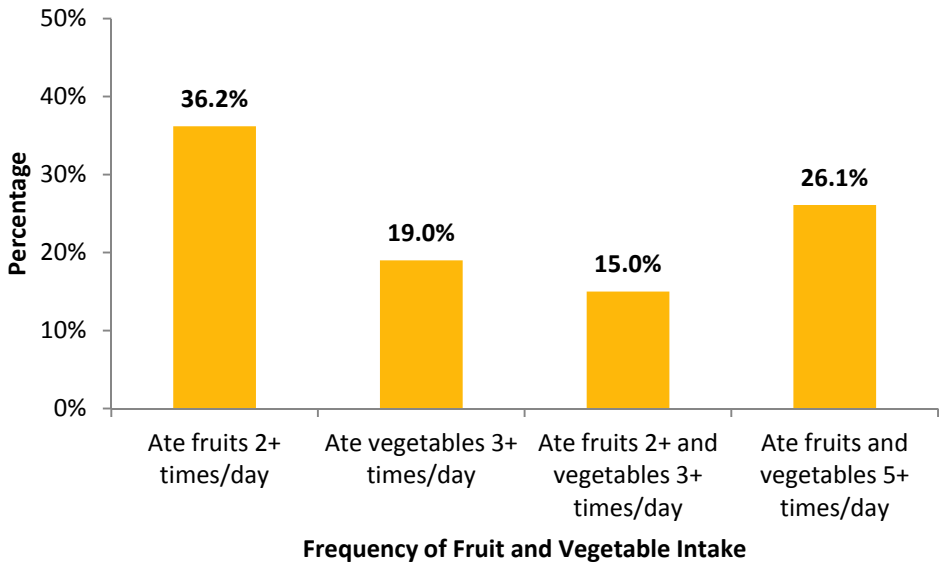
Characteristic	Percentage of high school students in grades 9-12 who ate fruits and vegetables 5+ times/day	95% Confidence Interval		
Total	17.0%	15.1%	to	19.1%
Gender				
Male	17.8%	14.9%	to	21.1%
Female	16.0%	13.5%	to	19.0%
Age group				
15 years or younger	17.3%	14.9%	to	20.0%
16 or 17 years old	16.6%	13.9%	to	19.6%
18 years or older	17.8%	13.0%	to	23.9%
Race and Ethnicity				
White, Non-Hispanic	15.7%	13.5%	to	18.2%
African American, Non-Hispanic	20.9%	14.8%	to	28.7%
Other/Multi-Race, Non-Hispanic	20.6%	15.8%	to	26.4%
Hispanic	20.3%	15.9%	to	25.5%
Grade				
9th grade	18.9%	15.6%	to	22.8%
10th grade	15.5%	11.8%	to	20.1%
11th grade	18.3%	14.6%	to	22.8%
12th grade	15.1%	10.6%	to	21.1%
Weight Status				
Overweight/Obese	17.3%	13.1%	to	22.5%
Neither overweight nor obese	16.9%	14.6%	to	19.5%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Fruit and Vegetable Consumption among Middle School Students

During the 2011/2012 school year, approximately one-third (36.2%; 95% CI: 32.1% to 40.5%) of Kansas middle school students in grades 6-8 consumed fruits 2 or more times per day in the past week and 19.0 percent (95% CI: 16.1% to 22.3%) consumed vegetables 3 or more times per day in the past week (Figure 5-5). Only 15.0 percent (95% CI: 12.3% to 18.2%) consumed fruits 2 or more times per day *and* vegetables 3 or more times per day in the past week. About 26.1 percent (95% CI: 22.9% to 29.7%) ate fruits and vegetables 5 or more times per day in the past week.

Figure 5-5. Frequency of fruit and vegetable consumption among middle school students in grades 6-8, Kansas 2011/2012 school year



Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.

There were no significant differences in eating fruits 2 or more times per day and vegetables 3 or more times per day in the past week among age groups, across grade levels or by obesity status. Similarly, there were no significant differences in eating fruits and vegetables 5 or more times per day in the past week among age groups, across grade levels or by obesity status (Table 5-6). However, the prevalence of eating fruits and vegetables 5 or more times per day in the past week was significantly higher among males (33.6%; 95% CI: 28.1% to 39.5%) compared to females (18.6%; 95% CI: 14.9% to 23.1%) and among non-Hispanic black/multi-racial/other races (39.1%; 95% CI: 29.0% to 50.2%) compared to non-Hispanic whites (20.2%; 95% CI: 17.1% to 23.7%). Similar patterns were observed for the prevalence of eating fruits 2 or more times per day *and* vegetables 3 or more times per day in the past week.

Table 5-6. Percentage of middle school students in grades 6-8 who ate fruits and vegetables 5 or more times per day in the past week by selected characteristics, Kansas 2011/2012 school year

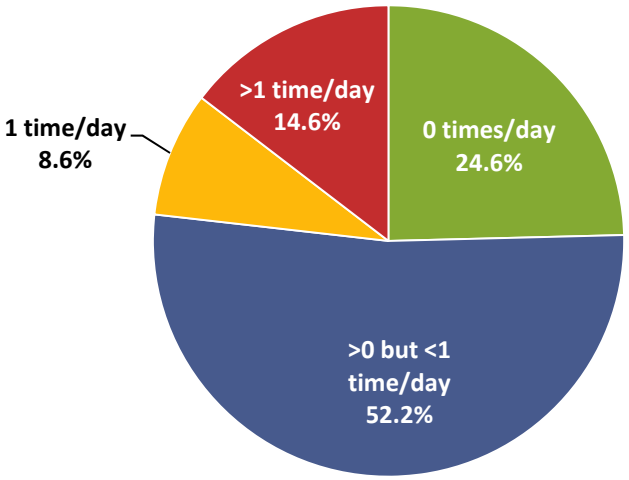
Characteristic	Percentage of middle school students in grades 6-8 who ate fruits and vegetables 5+ times/day	95% Confidence Interval		
Total	26.1%	22.9%	to	29.7%
Gender				
Male	33.6%	28.1%	to	39.4%
Female	18.6%	14.9%	to	23.1%
Age group				
11 years or younger	25.3%	17.2%	to	35.6%
12 years old	27.1%	21.5%	to	33.7%
13 years old	25.4%	20.2%	to	31.4%
14 years or older	26.8%	20.2%	to	34.6%
Race and Ethnicity				
White, Non-Hispanic	20.2%	17.1%	to	23.7%
African American/Other/Multi, Non-Hispanic	39.1%	29.0%	to	50.2%
Hispanic	30.7%	21.9%	to	41.3%
Grade				
6th grade	27.6%	22.7%	to	33.1%
7th grade	26.5%	20.2%	to	33.8%
8th grade	24.9%	19.4%	to	31.3%
Weight Status				
Overweight/obese	27.3%	21.7%	to	33.7%
Neither overweight nor obese	26.3%	22.6%	to	30.3%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.

Sugar-Sweetened Beverage Consumption among High School Students

During the 2010/2011 school year, a total of 76.8 percent (95% CI: 74.0% to 79.5%) of high school students in grades 9-12 drank a can, bottle or glass of soda or pop less than 1 time per day (Figure 5-5). However, 8.6 percent (95% CI: 7.0% to 10.4%) drank a can, bottle or glass of soda 1 time per day in the past week and an additional 14.6 percent (95% CI: 12.2% to 17.3%) drank a can, bottle or glass of soda or pop 2 or more times per day in the past week.

Figure 5-6. Frequency of drinking a can, bottle or glass of soda or pop among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

There were no significant differences in the percentage of Kansas high school students in grades 9-12 who drank a can, bottle or glass of soda or pop 1 or more times per day in the past week among age or race/ethnicity groups, or across grade levels or by obesity status (Table 5-7). However, the percentage who drank a can, bottle or glass of soda or pop 1 or more times per day in the past week was significantly higher among males (26.5%; 95% CI: 23.5% to 29.7%) compared to females (19.6%; 95% CI: 16.6% to 23.1%).

Table 5-7. Percentage of high school students in grades 9-12 who drank a can, bottle or glass of soda or pop 1 or more times per day in the past week by selected characteristics, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who drank a can, bottle or glass of soda or pop 1+ time/day	95% Confidence Interval
Total	23.1%	20.5% to 26.0%
Gender		
Male	26.5%	23.5% to 29.7%
Female	19.6%	16.6% to 23.1%
Age group		
15 years or younger	18.5%	15.1% to 22.5%
16 or 17 years old	25.1%	21.7% to 28.8%
18 years or older	26.5%	20.6% to 33.3%
Race and Ethnicity		
White, Non-Hispanic	23.1%	20.0% to 26.6%
African American, Non-Hispanic	23.5%	18.0% to 30.0%
Other/Multi-Race, Non-Hispanic	27.5%	20.1% to 36.3%
Hispanic	22.4%	18.5% to 26.9%
Grade		
9th grade	20.5%	16.6% to 25.1%
10th grade	22.0%	18.1% to 26.5%
11th grade	23.3%	18.6% to 28.8%
12th grade	27.4%	21.9% to 33.7%
Weight Status		
Overweight/Obese	26.8%	22.1% to 32.1%
Neither overweight nor obese	21.9%	18.9% to 25.1%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Sugar-Sweetened Beverage Consumption among Middle School Students

During the 2011/2012 school year, 23.7 percent (95% CI: 20.2% to 27.6%) of Kansas middle school students in grades 6-8 drank a can, bottle or glass of soda 1 or more times per day in the past week (Table 5-8). There were no significant differences in the percentage of Kansas middle school students in grades 6-8 who drank a can, bottle or glass of soda or pop 1 or more times per day in the past week among gender, age or race/ethnicity groups, or across grade levels or by overweight/obesity status.

Table 5-8. Percentage of middle school students in grades 6-8 who drank a can, bottle or glass of soda or pop 1 or more times per day in the past week by selected characteristics, Kansas 2011/2012 school year

Characteristic	Percentage of middle school students in grades 6-8 who drank a can, bottle or glass of soda or pop 1+ time/day	95% Confidence Interval
Total	23.7%	20.2% to 27.6%
Gender		
Male	27.5%	22.6% to 32.9%
Female	20.0%	15.9% to 25.0%
Age group		
11 years or younger	21.8%	16.4% to 28.5%
12 years old	21.9%	17.8% to 26.7%
13 years old	24.7%	18.9% to 31.6%
14 years or older	28.8%	20.0% to 39.5%
Race and Ethnicity		
White, Non-Hispanic	21.5%	17.2% to 26.4%
African American/Other/Multi, Non-Hispanic	27.6%	20.2% to 36.5%
Hispanic	25.1%	19.8% to 31.4%
Grade		
6th grade	21.3%	16.8% to 26.7%
7th grade	26.8%	22.0% to 32.3%
8th grade	22.9%	17.2% to 29.7%
Weight Status		
Overweight/obese	20.8%	14.9% to 28.2%
Neither overweight nor obese	24.6%	19.4% to 30.7%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.

Milk Consumption among High School and Middle School Students

During the 2011/2012 school year, 12.5 percent (95% CI: 10.1% to 15.4%) of Kansas high school students in grades 9-12 and 8.3 percent (95% CI: 5.8% to 11.7%) of Kansas middle school students in grades 6-8 did not drink milk in the past week.

Among Kansas high school students in grades 9-12, the percentage who did not drink milk in the past week was significantly higher among females (16.5%; 95% CI: 12.3% to 21.8%) compared to males (8.9%; 95% CI: 6.5% to 11.9%) and among non-Hispanic African Americans (28.3%; 95% CI: 19.1% to 39.7%) compared to non-Hispanic whites (11.2%; 95% CI: 8.5% to 14.5%) (Table 5-9). There were no significant differences in the percentage of Kansas high school students in grades 9-12 who did not drink milk in the past week among age groups or across grade levels.

Table 5-9. Percentage of high school students in grades 9-12 who did not drink milk in the past week by selected characteristics, Kansas 2011/2012 school year

Characteristic	Percentage of high school students in grades 9-12 who did not drink milk in the past 7 days	95% Confidence Interval
Total	12.5%	10.1% to 15.4%
Gender		
Male	8.9%	6.5% to 11.9%
Female	16.5%	12.3% to 21.8%
Age group		
15 years or younger	11.2%	8.1% to 15.1%
16 or 17 years old	13.3%	9.7% to 18.0%
18 years or older	14.5%	9.9% to 20.8%
Race and Ethnicity		
White, Non-Hispanic	11.2%	8.5% to 14.5%
African American, Non-Hispanic	28.3%	19.1% to 39.7%
Other/Multi, Non-Hispanic	11.9%	6.0% to 22.2%
Hispanic	12.8%	7.9% to 20.0%
Grade		
9th grade	8.8%	5.6% to 13.6%
10th grade	15.2%	12.1% to 18,9%
11th grade	11.6%	7.3% to 18.0%
12th grade	15.0%	9.8% to 22.2%

Source: 2012 Kansas Youth Tobacco Survey, Bureau of Health Promotion, KDHE.

Among Kansas middle school students in grades 6-8, there were no significant differences in the percentage who did not drink milk in the past week among gender, age or race/ethnicity groups, or across grade levels (Table 5-10).

Table 5-10. Percentage of high school students in grades 9-12 who did not drink milk in the past week by selected characteristics, Kansas 2011/2012 school year

Characteristic	Percentage of middle school students in grades 6-8 who did not drink milk in the past 7 days	95% Confidence Interval
Total	8.3%	5.8% to 11.7%
Gender		
Male	6.3%	3.9% to 10.1%
Female	10.1%	6.5% to 15.4%
Age group		
11 years or younger	6.0%	3.5% to 10.0%
12 years old	6.7%	4.3% to 10.4%
13 years old	8.7%	4.8% to 15.2%
14 years or older	15.0%	6.8% to 29.9%
Race and Ethnicity		
White, Non-Hispanic	6.7%	4.5% to 10.0%
African American/Other/Multi, Non-Hispanic	10.6%	4.8% to 21.7%
Hispanic	11.3%	8.0% to 15.9%
Grade		
6th grade	7.3%	5.2% to 10.1%
7th grade	6.2%	2.8% to 12.9%
8th grade	10.7%	5.7% to 19.3%

Breakfast Consumption among High School Students

During the 2010/2011 school year, 36.9 percent (95% CI: 33.3% to 40.7%) of Kansas high school students in grades 9-12 ate breakfast every day in the past week (Table 5-11). However, 12.8 percent (95% CI: 10.6% to 15.3%) did not eat breakfast on *any* day in the past week. There were no significant differences in eating breakfast every day in the past week among gender, age, or race/ethnicity groups, across grade levels or by overweight/obesity status.

Table 5-11. Percentage of high school students in grades 9-12 who ate breakfast every day in the past week by selected characteristics, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who ate breakfast everyday	95% Confidence Interval
Total	36.9%	33.3% to 40.7%
Gender		
Male	38.4%	34.0% to 42.9%
Female	35.5%	30.8% to 40.4%
Age group		
15 years or younger	41.2%	37.1% to 45.3%
16 or 17 years old	35.9%	31.2% to 40.9%
18 years or older	31.6%	24.7% to 39.4%
Race and Ethnicity		
White, Non-Hispanic	39.7%	35.8% to 43.8%
African American, Non-Hispanic	31.4%	23.7% to 40.4%
Other/Multi-Race, Non-Hispanic	29.4%	23.7% to 35.8%
Hispanic	29.4%	21.9% to 38.2%
Grade		
9th grade	41.3%	37.0% to 45.8%
10th grade	39.4%	33.3% to 45.8%
11th grade	36.2%	29.3% to 43.7%
12th grade	30.5%	24.6% to 37.2%
Weight Status		
Overweight/Obese	33.5%	29.5% to 37.8%
Neither overweight nor obese	38.1%	33.7% to 42.6%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Breastfeeding Guidelines

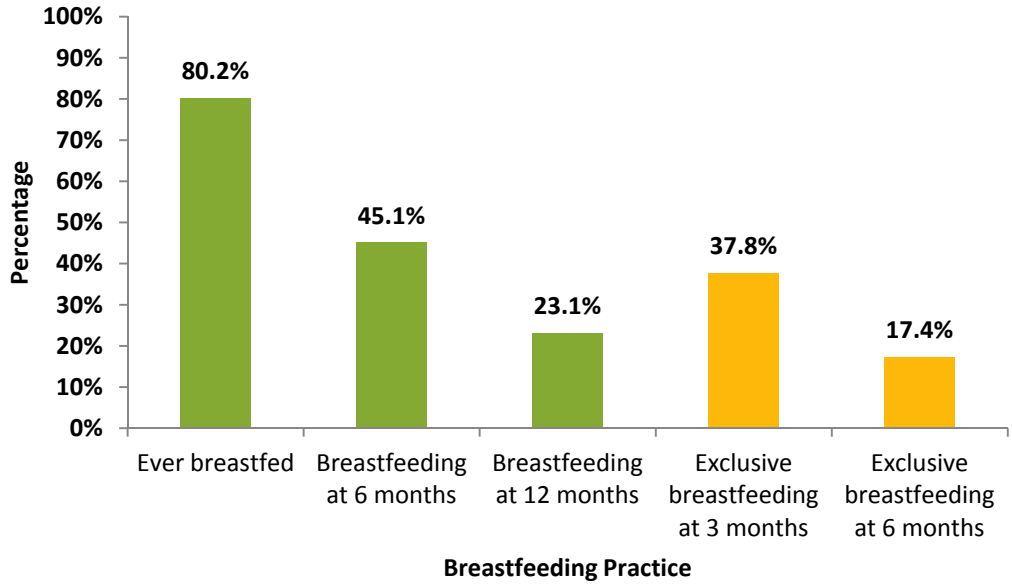
According to the American Academy of Pediatrics (AAP), "breastfeeding and human milk are the normative standards for infant feeding and nutrition."[24] Infant breastfeeding is associated with many health benefits, including decreased risks for respiratory illnesses, ear infections, gastrointestinal diseases, allergies, sudden infant death syndrome (SIDS) and adolescent and adult obesity.[25] In 2012, the AAP reaffirmed its previous recommendation of exclusive breastfeeding for the first six months of a baby's life, followed by breastfeeding in combination with complementary foods until at least 12 months of age.[24]

[24] American Academy of Pediatrics. Breastfeeding and the use of human milk. 2012; 129(3):e827-e841.
[25] American Academy of Pediatrics. New Mother's Guide to Breastfeeding, 2nd Edition. American Academy of Pediatrics; 2011.

Prevalence of Meeting Breastfeeding Guidelines

According to the 2012 Centers for Disease Control and Prevention (CDC) Breastfeeding Report Card, 80.2 percent of Kansas infants born in 2009 were ever breastfed (Figure 5-7). However, only 45.1 percent continued breastfeeding at 6 months and 23.1 percent continued breastfeeding at 12 months. Exclusive breastfeeding rates were lower with only 37.8 percent of Kansas infants born in 2009 exclusively breastfed at 3 months and only 17.4 percent exclusively breastfed at 6 months.

Figure 5-7. Prevalence of breastfeeding initiation, continuation, and exclusivity, Kansas 2009 births

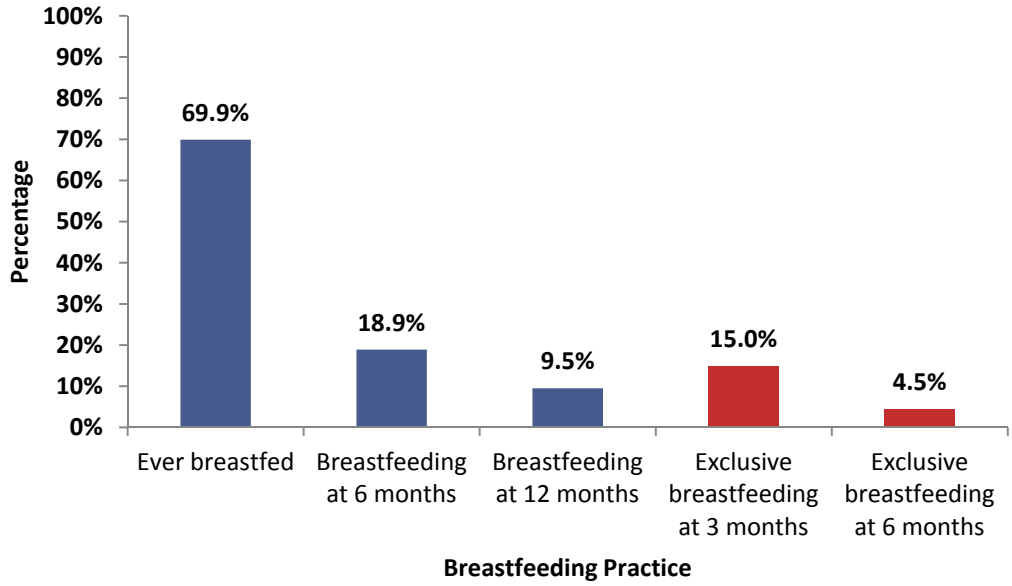


Source: 2012 Breastfeeding Report Card, Centers for Disease Control and Prevention.

Prevalence of Meeting Breastfeeding Guidelines among Low-Income Infants

According to the 2011 Pediatric Nutrition Surveillance System (PedNSS), 69.9 percent of low-income infants who participated in Kansas' Supplemental Nutrition Program for Women, Infants, and Children (WIC) were ever breastfed (Figure 5-8). However, only 18.9 percent continued breastfeeding at 6 months and 9.5 percent continued breastfeeding at 12 months. Exclusive breastfeeding rates were lower with only 15.0 percent of Kansas infants who participated in WIC in 2011 exclusively breastfed at 3 months and only 4.5 percent exclusively breastfed at 6 months.

Figure 5-8. Prevalence of breastfeeding initiation, continuation, and exclusivity among low-income infants who participated in WIC, Kansas 2011



Source: 2011 Pediatric Nutrition Surveillance System (PedNSS), Centers for Disease Control and Prevention.
Infants born during January 1-December 31, 2011 were included in the Ever Breastfed category. For each breastfeeding duration category, data includes only children who turned that age during January 1-December 31, 2011 by/on their date of visit.

CHAPTER 6: POLICY AND ENVIRONMENTAL SUPPORTS FOR PHYSICAL ACTIVITY AND NUTRITION

In 2009, the Centers for Disease Control and Prevention (CDC) released the *Recommended Community Strategies and Measurements to Prevent Obesity in the United States* in an effort to reverse the U.S. obesity epidemic.[26] These 24 recommended strategies encompass a comprehensive and coordinated approach that uses policy and environmental changes to support and promote healthy lifestyle choices for all U.S. residents in the places where they live, learn, work and play. Policy changes are defined as interventions that create or amend laws, ordinances, resolutions, mandates, regulations or rules, while environmental changes are defined as interventions that involve physical or material changes to the economic, social or physical environment.[27] Although individual behavior change is an essential component to preventing and treating obesity and chronic disease, policy and environmental changes are also important because they require less individual effort to implement, have a greater population impact and are more sustainable over time.[28]

The policy and environmental factors that support physical activity and nutrition are too numerous and complex to describe comprehensively in this document. However, this chapter presents data on selected policy and environmental factors for which public health surveillance systems are well established, including policy and environmental supports for physical activity and nutrition in schools and communities, as well as policy and environmental supports for breastfeeding.

[26] Centers for Disease Control and Prevention. Recommended community strategies and measurements to prevent obesity in the United States. MMWR 2009;58(No. RR-7):1-29

[27] National Association of County & City Health Officials (NACCHO). Issue Brief: Healthy Communities, Healthy Behaviors: Using Policy, Systems, and Environmental Change to Combat Chronic Disease. Washington, DC: NACCHO; 2011.

[28] Friedan TR. A framework for public health action: the health impact pyramid. Am J Public Health. 2010; 100(4):590-595.

Policy and Environmental Supports for Physical Activity in Schools

According to the 2010 Kansas School Health Profiles, among Kansas middle, junior high and senior high schools [29]:

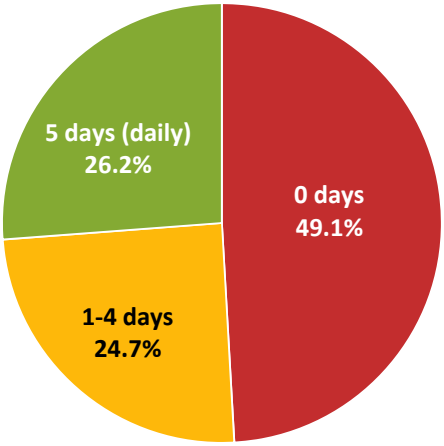
- 97.0 percent (95% CI: 95.1% to 98.1%) of schools required physical education in any of grades 6 through 12.
- 92.4 percent (95% CI: 88.8% to 94.9%) of schools taught a required physical education course in 9th grade, 18.0 percent (95% CI: 13.2% to 24.1%) in 10th grade and only 9.4 percent (95% CI: 6.1% to 14.2%) in 11th and 12th grade, respectively.
- 43.2 percent (95% CI: 39.0% to 47.5%) of schools offered opportunities for all students to participate in intramural activities or physical activity clubs.
- 81.8 percent (95% CI 78.1% to 85.0%) of schools have children or adolescents use indoor physical activity or athletic facilities for community-sponsored physical activity classes or lessons.

[29] 2010 School Health Profiles, Kansas State Department of Education.

Physical Education Class Attendance among High School Students

During the 2010/2011 school year, 26.2 percent (95% CI: 20.2% to 33.4%) of Kansas high school students in grades 9-12 attended physical education (P.E.) classes daily during an average school week (Figure 6-1). However, 49.1 percent (95% CI: 42.4% to 55.8%) did not attend P.E. class on *any* day in an average school week during this time period.

Figure 6-1. Frequency in average school week of attending physical education (P.E.) classes among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

The percentage of Kansas high school students in grades 9-12 who attended P.E. classes daily during an average school week was significantly higher among males (33.4%; 95% CI: 25.9% to 41.8%) compared to females (18.9%; 95% CI:13.9% to 25.2%) (Table 6-1). There were no significant differences in attending P.E. classes daily during an average school week among age or race/ethnicity groups, across grade levels or by overweight/obesity status.

Table 6.1. Percentage of high school students in grades 9-12 who attended physical education classes (P.E.) daily during an average school week, Kansas 2010/2011 school year

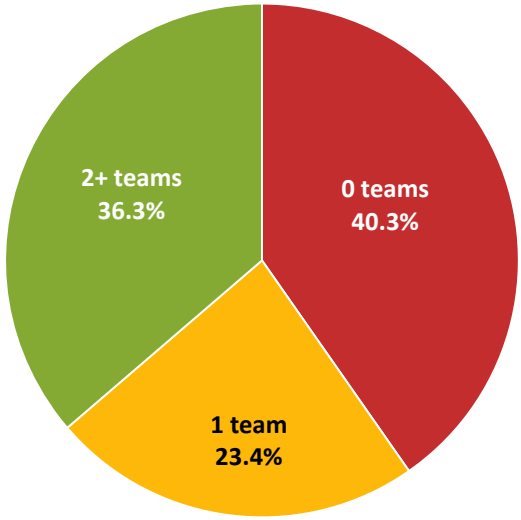
Characteristic	Percentage of high school students in grades 9-12 who attended P.E. classes daily	95% Confidence Interval		
Total	26.2%	20.2%	to	33.4%
Gender				
Male	33.4%	25.9%	to	41.8%
Female	18.9%	13.9%	to	25.2%
Age group				
15 years or younger	30.1%	18.7%	to	44.6%
16 or 17 years old	21.9%	15.9%	to	29.3%
18 years or older	31.3%	24.9%	to	38.5%
Race and Ethnicity				
White, Non-Hispanic	25.4%	19.5%	to	32.4%
African American, Non-Hispanic	28.2%	19.9%	to	38.5%
Other/Multi-Race, Non-Hispanic	27.5%	17.2%	to	41.0%
Hispanic	29.6%	16.8%	to	46.6%
Grade				
9th grade	31.9%	17.8%	to	50.3%
10th grade	22.9%	14.4%	to	34.4%
11th grade	20.3%	12.8%	to	30.7%
12th grade	29.3%	24.3%	to	35.0%
Weight Status				
Overweight/Obese	26.7%	19.2%	to	35.9%
Neither overweight nor obese	26.2%	20.1%	to	33.2%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Participation in Sports Teams among High School Students

During the 2010/2011 school year, 59.7 percent (95% CI: 57.1% to 62.3%) of Kansas high school students in grades 9-12 played on at least 1 sports team in the past year (Figure 6-2). However, 40.3 percent (95% CI: 37.7% to 42.9%) did not play on *any* sports teams in the past year.

Figure 6-2. Number of sports teams played on in past 12 months among high school students in grades 9-12, Kansas 2010/2011 school year



Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

The percentage of Kansas high school students in grades 9-12 who played on at least 1 sports team in the past year was significantly higher among males (65.6%; 95% CI: 61.9% to 69.0%) compared to females (53.5%; 95% CI: 48.8% to 58.1%) and among students who were neither overweight nor obese (62.4%; 95% CI: 59.2% to 65.4%) compared to students who were overweight or obese (53.9%; 95% CI: 49.7% to 58.1%) (Table 6-2). There were no significant differences in playing on at least 1 sports team in the past year among age or race/ethnicity groups or across grade levels.

Table 6.2. Percentage of high school students in grades 9-12 who played on at least 1 sports team in past year, Kansas 2010/2011 school year

Characteristic	Percentage of high school students in grades 9-12 who played on 1+ sports team in past year	95% Confidence Interval		
Total	59.7%	57.1%	to	62.3%
Gender				
Male	65.6%	61.9%	to	69.0%
Female	53.5%	48.8%	to	58.1%
Age group				
15 years or younger	60.9%	56.2%	to	65.5%
16 or 17 years old	59.2%	55.3%	to	63.1%
18 years or older	59.0%	51.3%	to	66.4%
Race and Ethnicity				
White, Non-Hispanic	61.0%	57.6%	to	64.3%
African American, Non-Hispanic	59.6%	49.0%	to	69.4%
Other/Multi-Race, Non-Hispanic	55.9%	48.6%	to	62.9%
Hispanic	54.5%	49.6%	to	59.4%
Grade				
9th grade	58.1%	52.5%	to	63.5%
10th grade	62.8%	56.8%	to	68.4%
11th grade	59.1%	53.2%	to	64.7%
12th grade	58.4%	51.5%	to	65.0%
Weight Status				
Overweight/Obese	53.9%	49.7%	%	58.1%
Neither overweight nor obese	62.4%	59.2%	to	65.4%

Source: 2011 Kansas Youth Risk Behavior Survey, Kansas State Department of Education.

Policy and Environmental Supports for Nutrition in Schools

According to the 2010 Kansas School Health Profiles, among Kansas middle, junior high and senior high schools [29]:

- 17.0 percent (95% CI: 13.9% to 20.8%) of schools always or almost always offer fruits or non-fried vegetables at school celebrations when foods or beverages are offered.
- 76.1 percent (95% CI: 72.3% to 79.5%) of schools allow students to purchase snack foods or beverages from one or more vending machines at the school or at a school store, canteen, or snack bar.
- 45.0 percent (95% CI: 40.5% to 49.6%) of schools limit the package or serving size of any individual food and beverage items sold in vending machines or at the school store, canteen, or snack bar.
- 13.6 percent (95% CI: 10.8% to 17.0%) of schools have priced nutritious foods and beverages at a lower cost while increasing the price of less nutritious foods and beverages.
- 46.9 percent (95% CI: 42.2% to 51.6%) of schools have collected suggestions from students, families and school staff on nutritious food preferences and strategies to promote healthy eating.
- 45.8 percent (95% CI: 41.3% to 50.3%) of schools have provided information to students or families on the nutrition and caloric content of foods available.
- 23.7 percent (95% CI: 19.8% to 28.0%) of schools have conducted taste tests to determine food preferences for nutritious items.
- 16.8 percent (95% CI: 13.6% to 20.6%) of schools have provided opportunities for students to visit the cafeteria to learn about food safety, food preparation or other nutrition-related topics.

- 2.5 percent (95% CI: 1.4% to 4.4%) of schools promote candy, meals from fast food restaurants or soft drinks through the distribution of products, such as t-shirts, hats and book covers to students.
- 48.2 percent (95% CI: 43.4% to 52.9%) of schools have prohibited advertisements for candy, fast food restaurants or soft drinks in the school building
    - 42.0 percent (95% CI: 37.6% to 46.6%) have prohibited such ads on school grounds including on the outside of the school building, on playing fields or other areas of the campus.
    - 56.8 percent (95% CI: 51.9% to 61.6%) have prohibited such ads on school buses or other vehicles used to transport students.
    - 45.2 percent (95% CI: 40.8% to 49.8%) have prohibited such ads in school publications, such as newsletters, newspapers, web sites or other school publications.

Policy and Environmental Supports for Physical Activity in Communities

Community-level policy and environmental supports for physical activity encompass land use, transportation, and social and economic development. For example, physical activity may be inhibited by zoning laws that separate residential areas from schools and shopping centers, making walking or biking to such locations too time-consuming or dangerous. In contrast, designing walking trails and safe bike paths throughout communities can promote increased physical activity.[30]

Unfortunately, there are relatively few policy and environmental indicators for physical activity routinely monitored by public health surveillance systems at the state-level. Similarly, there are no public health surveillance systems that capture local-level policies despite the fact that local governments in Kansas have been proactive in passing policies that support physical activity within their communities.

In 2010, the Centers for Disease Control and Prevention (CDC) published the *State Indicator Report on Physical Activity* which included selected *state-level* policy and environmental indicators for physical activity.[31] According to the *Report*:

- In 2007, 50.1 percent of Kansas youth aged 17 years and younger had parks, community centers and sidewalks in their neighborhood.
- In 2007, 7.7 percent of Kansas' census blocks had a park and 11.0 percent had a fitness center within a half-mile of their boundary.

[30] Centers for Disease Control and Prevention. Healthy Places. http://www.cdc.gov/healthyplaces/about.htm. Accessed January 10, 2013.
[31] Centers for Disease Control and Prevention. *State Indicator Report on Physical Activity, 2010*. Atlanta, GA: U.S. Department of Health and Human Services, 2010.

- From 2001 to 2009, there were no *state-level* community-scale urban design or land use policies enacted in Kansas.
    - Such policies may support creating more livable communities; promoting zoning regulations and building codes related to community design; encouraging transit-oriented development; improving preservation or creation of green spaces; providing safe and attractive recreation trails for residents to visit retail or commercial establishments; promoting mixed-land use; promoting "Smart Growth" plans; promoting school siting, zoning or development near residential areas; or specifying health impact assessments as related to community design.
- From 2001 to 2009, there were no *state-level* street-scale urban design or land use policies enacted in Kansas.
    - Such policies may support increasing the ease and safety of street crossing or sidewalk use; creating or providing safe, secure and enjoyable streets and sidewalks for walking and biking; redesigning streets and sidewalks; or promoting "Complete Streets."
- From 2001 to 2009, there were no *state-level* transportation and travel policies enacted in Kansas.
    - Such policies may support improving pedestrian, transit and light rail access and use; creating or enhancing bike lanes; requiring sidewalks; subsidizing transit or incentivizing car or van pools; promoting active transportation to school; or creating or promoting walking, bicycling and hiking trails.

In addition, according to the United States Department of Agriculture (USDA) Food Environment Atlas, there were 273 recreation and fitness facilities in 2009 in Kansas, or 1.0 per 10,000 persons.[32] This number was relatively unchanged from 2007 when there were 285 recreation and fitness facilities in Kansas, or 1.0 per 10,000 persons.

[32] Economic Research Service (ERS), U.S. Department of Agriculture (USDA). Food Environment Atlas. http://www.ers.usda.gov/data-products/food-environment-atlas.aspx. Accessed: January 11, 2013.

Environmental Supports for Nutrition in Communities

The food environment is defined as the physical presence of food that affects an individual's diet; a person's proximity to food store locations; the distribution of food stores or food services; or a connected system that allows access to food.[33] A number of food environment indicators are currently tracked by the United States Department of Agriculture's (USDA) Economic Research Service (ERS), including availability of grocery stores, convenience stores, fast food restaurants and farmers' markets.[34]

Table 6-3 describes the availability of food retailers and food service providers in Kansas. From 2007 to 2009, there were decreases in the number of grocery stores, convenience stores, and fast-food restaurants, and an increase in the number of supercenters and club stores and full-service restaurants. From 2009 to 2012, there was an increase in the number of farmers' markets in Kansas.

[33] Centers for Disease Control and Prevention. General food environment resources. http://www.cdc.gov/healthyplaces/healthtopics/healthyfood/general.htm. Accessed January 4, 2013.
[34] Economic Research Service (ERS), U.S. Department of Agriculture (USDA). Food Environment Atlas. http://www.ers.usda.gov/data-products/food-environment-atlas.aspx. Accessed January 4, 2013.

Table 6-3. Availability of food retailers and food service providers, Kansas 2007, 2009, 2012

Source	Description	Count (2007)	Count (2009)	% Change	Count per 10,000 Persons (2007)	Count per 10,000 Persons (2009)
Grocery stores	Retail food such as canned and frozen foods; fresh fruits and vegetables; and fresh and prepared meats, fish and poultry	522	483	-7.5%	1.9	1.7
Supercenters and club stores	Retail a general line of groceries in combination with general lines of new merchandise, such as apparel, furniture and appliances	38	65	+71.1%	0.1	0.2
Convenience stores	Retail limited foods that include milk, bread, soda and snacks	1,140	1,016	-10.9%	4.1	3.6
Specialized food stores	Retail specialized lines of food, such as retail bakeries, meat and seafood markets, dairy stores and produce markets	189	191	0.0%	0.7	0.7
Fast-food restaurants	Provide food services (except snack and nonalcoholic beverage bars) where patrons generally order or select items and pay before eating	1,940	1,874	-3.4%	7.0	6.6
Full service restaurants	Provide food services to patrons who order and are served while seated and pay after eating	2,016	2,032	+0.8%	7.3	7.2
Source	**Description**	**Count (2009)**	**Count (2012)**	**% Change**	**Count per 10,000 Persons (2009)**	**Count per 10,000 Persons (2012)**
Farmers' markets	Retail outlets in which two or more vendors sell agricultural products directly to customers through a common marketing channel	80	98	+22.5%	0.3	0.3

Source: 2012 Food Environment Atlas, United States Department of Agriculture (USDA).
State population estimates for 2007 and 2009 are based on vintage 2009 population estimates from the U.S. Census Bureau. State population estimates for 2012 are based on vintage 2012 population estimates from the U.S. Census Bureau. For more information, visit http://www.ers.usda.gov/data-products/food-environment-atlas/data-access-and-documentation-downloads.aspx.

Policy and Environmental Supports for Breastfeeding

The CDC Breastfeeding Report Card tracks a number of indicators that measure breastfeeding support from birth facilities, mothers, health professionals, and child care settings.[35]

Birth facility support is measured by three indicators:

(1) the State Maternity Practices in Infant Nutrition and Care (mPINC) score (out of 100), which represents the extent to which a state's birth facilities provide maternity care that supports breastfeeding;
(2) the percent of live births occurring at facilities designated as Baby-Friendly, an international recognition of best practices in maternity care; and
(3) the percentage of breastfed infants receiving formula before 2 days of age.

- According to the 2012 CDC Breastfeeding Report Card, the average mPINC score in Kansas was 64, compared to the U.S. national average of 70. Zero percent (0%) of live births occurred at Baby Friendly facilities, compared to the U.S. national average of 6.22 percent. An estimated 22.1 percent of breastfed infants received formula before 2 days of age.

[35] Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention. CDC Breastfeeding Report Card—United States, 2012.

Mother-to-mother support is measured by the number of La Leche League (LLL) leaders per 1,000 live births, which gives a broad estimate of the availability of breastfeeding assistance in a state. LLL leaders are trained and accredited volunteer mothers who provide support to pregnant and breastfeeding mothers at group meetings, online, via telephone and community partnerships.

- According to the 2012 CDC Breastfeeding Report Card, there were 1.92 LLL leaders per 1,000 live births in Kansas, compared to 0.95 LLL leaders per 1,000 live births nationally.

Professional support is measured by the number of International Board Certified Lactation Consultants (IBCLCs) per 1,000 live births. IBCLCs are health professionals who specialize in clinical management of breastfeeding and assist the mother-infant pair, create and administer lactation programs and education other health professionals about breastfeeding.

- According to the 2012 CDC Breastfeeding Report Card, there were 3.40 IBCLCs per 1,000 live births in Kansas, compared to 3.24 IBCLCs per 1,000 live births nationally.

Child care support is measured by whether or not a state has child care regulation that supports onsite breastfeeding.

- According to the 2012 CDC Breastfeeding Report Card, Kansas does not have any *state-level* child care regulations that support onsite breastfeeding.

TECHNICAL NOTES

Data Sources

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is an ongoing, population-based, random-digit-dialed telephone survey of non-institutionalized civilian adults 18 years and older. The survey is coordinated by the Centers for Disease Control and Prevention (CDC) and is conducted annually by all 50 states, the District of Columbia, and several U.S. territories. This report includes BRFSS data collected by the Bureau of Health Promotion (BHP), Kansas Department of Health and Environment from 2000 to 2011.

The complex survey methodology and analytical procedures for BRFSS are designed to produce prevalence estimates that can be generalized to Kansas adults statewide. A more detailed explanation of the survey methodology used for the Kansas BRFSS is available at: http://www.kdheks.gov/brfss/technotes.html.

Several considerations should be taken into account when interpreting BRFSS estimates:

- Due to new survey methodology beginning in 2011, including dual-frame sampling and iterative proportional fitting (or raking) weighting methodology, *2011 BRFSS data cannot be compared to previous years.* More information about changes in survey methodology and impact of methodology on BRFSS prevalence estimates is available at: http://www.kdheks.gov/brfss/PDF/2011_Kansas_BRFSS_New_Survey_Methodology.pdf.
- BRFSS estimates do not apply to individuals without telephone service, those who reside on military bases or within institutions or those who are unable to complete a telephone survey.
- BRFSS prevalence estimates are self-reported and are subject to bias due to respondents' inability or unwillingness to provide accurate information about their own behaviors or characteristics.
- Prevalence estimates are only reported when they are based on at least 50 denominator respondents and 5 numerator respondents.

Youth Risk Behavior Survey (YRBS)

The Kansas YRBS is part of a biennial national effort coordinated by the CDC to monitor health risks and behaviors among youth, including physical activity and nutrition. In spring 2011, the Kansas State Department of Education conducted the YRBS in a random sample of Kansas high schools, which included nearly 2,000 students in grades 9-12. Weighted YRBS data can be generalized to all 9th-12th grade students in Kansas. Additional Kansas YRBS data can be found on the Kansas Coordinated School Health website at: www.kshealthykids.org.

Youth Tobacco Survey (YTS)

The Kansas YTS is part of a biennial national effort coordinated by the CDC to monitor tobacco-related behaviors among youth. Self-reported height and weight are also collected as part of this survey. During the 2011/2012 school year, the Kansas Department of Health and Environment conducted the YTS in a random sample of Kansas high schools and middle schools, which included nearly 950 students in grades 6-8. Weighted YTS middle school data can be generalized to all 6^{th}-8^{th} grade students in Kansas. Additional Kansas YTS data can be found on the Kansas Tobacco Use Prevention Program website at: www.kdheks.gov/tobacco.

Pediatric Nutrition Surveillance System (PedNSS)

The PedNSS is a national program-based public health surveillance system that describes the weight and nutritional status of low-income U.S. Children who participate in federally-funded maternal and child health and nutrition programs. In Kansas, all PedNSS data comes from the Kansas Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Additional Kansas PedNSS data is available at: http://www.kansaswic.org/kansas_WIC/pediatric_and_pregnancy_nutrition_surveillance.html.

School Health Profiles (SHPs)

The SHPs monitors the current status of school health education requirements and content; physical education requirements; school health policies; asthma management activities; and family and community involvement in school health programs. In Kansas, the SHPs survey is conducted every two years by the Kansas State Department of Education among middle and high school principals and lead health education teachers.

Statistical Methods

All statistical analyses presented in this report were conducted using SAS version 9.3.

Age-adjusted Rates

Age adjustment is a statistical method for standardizing rates so that groups with different underlying age distributions are more comparable. Age-adjusted rates can be used to compare two different groups at the same time or the same group over time, if the underlying age distributions are different or change. Age-adjusted rates are not actual measures of burden and are not comparable to unadjusted (crude) rates.

Age-adjusted rates in this report are calculated using the direct method. Briefly, rates are first calculated within each age subgroup to create age-specific rates. Each age-specific rate is then multiplied by the proportion of the U.S. Standard Population in that particular age category.[36] These products are then summed across age subgroups to produce an age-adjusted rate. For BRFSS age-adjusted prevalence estimates, age-specific rates are based on 5 age groups: 18-24, 25-34, 35-44, 45-64, 65+ years. Age-adjusted rates were not calculated for YRBS or YTS data due to the already limited age range of respondents.

95% Confidence Intervals

All rates and prevalence estimates are estimates of a true value (population parameter) and are thus subject to random variation. 95% confidence intervals are used to characterize this variability and can be thought of as a range of values that will contain the true value 95% of the time. For BRFSS prevalence estimates, the complex survey design is taken into account for variance estimation and 95% confidence intervals were computed using a normal approximation. For YRBS and YTS prevalence estimates, logit confidence limits were computed.

County Population Density Subgroups

County population density subgroups were established by the Kansas Department of Health and Environment's Office of Local and Rural Health (Table T-1). County population density peer groups are based on the population for each county in 2010 and are defined as follows: frontier (fewer than 6 persons per square mile), rural (6 to 19.9 persons per square mile), densely-settled rural (20 to 39.9 persons per square mile), semi-urban (40 to 149.9 persons per square mile), and urban (150 or more persons per square mile).

[36] Klein RJ, Schoenborn CA. Age adjustment using the 2000 Projected U.S. Population. Healthy People Statistical Notes, no. 20. Hyattsville, Maryland: National Center for Health Statistics. January 2001.

Table T-1. County population density subgroups, Kansas 2010

Category	Population Density	Kansas Counties
Frontier	Fewer than 6 persons per square mile	Barber, Chase, Chautauqua, Cheyenne, Clark, Comanche, Decatur, Edwards, Elk, Gove, Graham, Greeley, Greenwood, Hamilton, Hodgeman, Jewell, Kearny, Kiowa, Lane, Lincoln, Logan, Meade, Morton, Ness, Osborne, Rawlins, Rooks, Rush, Sheridan, Sherman, Smith, Stafford, Stanton, Trego, Wallace, Wichita
Rural	6 to 19.9 persons per square mile	Anderson, Brown, Clay, Cloud, Coffey, Ellsworth, Grant, Gray, Harper, Haskell, Kingman, Linn, Marion, Marshall, Morris, Nemaha, Norton, Ottawa, Pawnee, Phillips, Pratt, Republic, Rice, Russell, Scott, Stevens, Thomas, Wabaunsee, Washington, Wilson, Woodson
Densely-Settled Rural	20 to 39.9 persons per square mile	Allen, Atchison, Barton, Bourbon, Cherokee, Cowley, Dickinson, Doniphan, Ellis, Finney, Ford, Jackson, Jefferson, Labette, Lyon, McPherson, Neosho, Osage, Pottawatomie, Seward, Sumner
Semi-Urban	40 to 149.9 persons per square mile	Butler, Crawford, Franklin, Geary, Harvey, Miami, Montgomery, Reno, Riley, Saline
Urban	150 or more persons per square mile	Douglas, Johnson, Leavenworth, Sedgwick, Shawnee, Wyandotte

Source: Bureau of Epidemiology and Public Health Informatics, Kansas Department of Health and Environment.

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